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DoD Implementation Guidelines for Electronic Data Interchange (EDI)

Volume I

December 1991

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EXECUTIVE AGENT FOR EC/EDI/PLUS
Defense Logistics Agency
Cameron Station
Alexandria, VA 22304-6100

PREFACE

The implementation guidelines presented in Volumes I and II were developed by the Department of Defense (DoD) for new participants in the electronic data interchange (EDI) program and for documenting DoD's EDI data requirements.

Volume I contains Chapters 1-9. Those chapters describe the background, scope, and main issues that need to be considered when implementing EDI.

Volume II contains Chapter 10 only; it establishes a baseline of DoD's conventions for implementing the American National Standards Institute (ANSI) Accredited Standards Committee (ASC) X12 uniform standards for electronic interchange of business transactions. This baseline is not all-encompassing. Functional analysts may need to supplement the conventions to further clarify their use in a specific functional application such as the use of the 810 Invoice for progress payments or use of the 856 Ship Notice/Manifest for the transfer or sale of an aviation fuel product. This type of supplement, called an application-specific convention, is permitted.

In the application-specific convention, data segments and data elements must comply with the conventions as defined in the guidelines. If the convention does not meet your needs, you can request a convention be changed to include your specific data requirements. Chapter 5, *Maintenance*, explains where to send your comments and how to make changes to the conventions by submitting data maintenance requests.

To determine whether an application-specific convention exists, you should contact the DoD Executive Agent for EDI at the address below:

DoD Executive Agent for EDI
Defense Logistics Agency
ATTN: DLA-ZIE
Cameron Station
Alexandria, VA 22304-6100

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Accredited Standards Committee X12

Aerospace Industries Association

American Iron and Steel Institute

American Petroleum Institute

Automotive Industry Action Group

National Automated Clearinghouse Association

Data Interchange Standards Association

Electronic Data Interchange Association

Uniform Code Council, Inc.

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1.0 INTRODUCTION

This chapter explains the purpose of these guidelines, the scope of the guidance, the authority for publishing a general introduction to EDI and an explanation of how to use the guidelines.

1.1 PURPOSE OF THE GUIDELINES

These guidelines provide general guidance on the implementation of American National Standards Institute (ANSI) Accredited Standards Committee (ASC) X12 electronic data interchange (EDI) standards within automated information systems (AIS) and information interchange procedures that require the collection, reporting, and/or exchange of data needed to perform Defense missions.

1.2 SCOPE

The guidance is provided for two components. First, it may be used by organizational elements of the DoD community. It may also be useful to organizations external to DoD that exchange data with the DoD community in the course of their business relationships. Many of these organizations also engage in the planning, development, test and evaluation, standardization, implementation and/or maintenance of ANSI ASC X12 standards in automated system applications and associated information interchange procedures.

The DoD community encompasses the Military Services, Organizations of the Joint Chiefs of Staff, Unified and Specified Commands, Office of the Secretary of Defense, and the Defense agencies. (That community is collectively referred to as the DoD Components.)

Organizational entities external to DoD include (a) non-Government organizations, both commercial and nonprofit; (b) Federal agencies of the United States Government other than DoD; (c) local and state governments; (d) foreign national governments; and (e) international government organizations.

1.2.1 Adoption

The conventions published in this document are for trial use and comment. DoD Components that are now using ASC X12 standards or industry-specific standards may continue to do so and convert to DoD conventions at an appropriate time (e.g., major system change or revision of the standard used). However, such DoD Components must submit to the DoD EDI Executive Agent (EA) their data requirements that are not covered in the conventions as soon as possible, as indicated in Chapter 5.0, Section 5.1.1.

New implementations must use the DoD conventions. If no convention exists or if changes are needed, DoD Components

must submit their requirements as indicated in Chapter 5.0, Section 5.1.1.

1.2.2 Waivers

Waivers will be granted by the DoD EA if compliance would adversely affect mission accomplishment or have a major financial impact that is not offset by DoD-wide savings. Waiver requests should be submitted to:

DoD EDI Executive Agent
ATTN: DLA-ZIE
Cameron Station
Alexandria, VA 22304-6100

1.3 RESPONSIBLE ENTITY

The Defense Logistics Agency (DLA) is DoD's Executive Agent for implementing and maintaining Defense-wide programs for (a) EDI in accordance with DepSecDef memorandum of May 24, 1988, Subject: *Electronic Data Interchange of Business-Related Transactions*; and (b) Protection of Logistics Unclassified/Sensitive Systems (PLUS) in accordance with Assistant Secretary of Defense (Production and Logistics) [ASD(P&L)] memorandum of November 21, 1989, Subject: *Production and Logistics Task Group for Data Protection*. Publication of these guidelines is based upon this authority. See Chapter 5.0 Maintenance for office point of contact.

1.4 INTRODUCTION TO EDI

Electronic data interchange can take many forms. The following helps define EDI.

1.4.1 What Is EDI?

Electronic data interchange is the computer-to-computer exchange of routine digital business information in an agreed upon standard. It is commonplace in many private companies and promises to become the preferred method for conducting all business in the future. With the appropriate computer hardware, software, and communications, businesses can eliminate the tedious flow of paper purchase orders, invoices, shipping forms, technical specifications, and other documents and replace them with their electronic equivalents. The motivations to do so are impelling: the typical costs for processing a multipart document from "cradle to grave" can range from \$10 to \$40 or more, and conducting business electronically can slash those costs by a third to a half. Other benefits are discussed in Section 1.4.6.

1.4.2 What Is New About EDI?

Certainly the computer-to-computer interchange of information is not new to American industry nor to the Department of Defense. Since the mid-1950s, large private companies and DoD activities have been electronically communicating business information. Because each user communicated in a unique format, however, businesses found it cumbersome and time consuming to expand

their electronic communications to new customer (trading partners).

What is new is the emergence of nationally and internationally recognized data formats, commonly referred to as standards or transaction sets, that serve to broaden and ease the interchange of data. These commercial standards eliminate the need to create special software to receive or send user-unique data formats. Instead, one software package designed to generate and interpret standard formats can be used to exchange information with all trading partners. And, interestingly, many companies are now using these same standards to facilitate their internal exchange of information.

1.4.3 Who Creates These Standards?

Two key standards groups developed the standards for North America: the Transportation Data Coordinating Committee (TDCC) and ANSI. The TDCC, formed in the late 1960s, initially concentrated its efforts on creating transportation standards for the rail, motor, air, and ocean industries. Its success led other industry groups to seek its help; the grocery, chemical, and warehousing industries, to name a few. As the TDCC created industry-oriented standards, some companies and individuals that used them saw the need for generic standards that cut across industry boundaries.

In 1979, ANSI formed the ASC X12 to do just that: develop uniform standards for electronically interchanging digital business transactions between and among industries. What this means is that the automotive industry, for example, can now use a single standard to exchange electronic purchase orders, invoices, and technical specifications with chemical, textile, and steel industries.

The TDCC and ANSI, through the Joint Electronic Data Interchange Committee, have created and published a data dictionary that provides for common data elements, segments, and codes, in essence a common set of definitions and terms for creating standards.

1.4.4 What Resources Do I Need?

A business needs three general resources to interchange data electronically: computer hardware, computer software, and communications capability. Equally important is the way those resources are configured. A company or DoD activity can use a mainframe computer to communicate directly with a trading partner using an industry-accepted standard. It can purchase translation software from a software vendor and then integrate that software into an existing data processing system. The software translates the user's unique data formats into standard data formats before they are electronically transmitted. Translation software designed for mainframe computers costs from \$20,000 to \$200,000. Very few private-sector companies choose to develop their own software.

Even with a mainframe computer, communications are typically handled over telephone lines. A company, for instance, will dial one of its largest vendors, connect to its computer, and transmit electronic purchase orders.

Alternatively, a company or DoD activity may elect to operate in a front-end environment in which the host computer — the mainframe — simply transfers a file of purchase orders (or other digital business documents) to a front-end computer — a microcomputer on which the EDI translation software resides. The microcomputer then translates the user-unique format into the standard format and transmits the standard-formatted file to the trading partners. Many companies prefer this front-end environment for two reasons: its start-up costs are a modest \$10,000 to \$15,000 and the data in the host computer are secure since trading partners have access to the front-end microcomputer only.

Although the front-end microcomputer environment offers a low-cost entry into EDI and a high degree of flexibility, it also has some disadvantages. One disadvantage is that as a company's EDI programs expand, the processing capability of a microcomputer can become overwhelmed. Another disadvantage — and one common to direct use of a mainframe computer — is the need to communicate directly with trading partners. Each communications session involves dialing, connecting, and transmitting to the trading partner's computer, a relatively easy task if a company has only a handful of trading partners. However, if the EDI program encompasses many trading partners, the scheduling of communications sessions can become a real problem.

1.4.5 What Third-Party Services Are Available?

Another alternative operating concept uses the "electronic mailboxes" provided by third-party, or value-added network (VAN), services. A company can transmit all of its purchase orders, invoices, shipping, technical specifications, or other electronic transactions to the VAN in a single communications session and thus solve the communications scheduling problem. The standards are structured such that the VAN can deposit transactions into each trading partner's "electronic mailbox." The trading partners can then dial the VAN, receive their transactions, and deposit new transactions for others, all in one communications session. VANs also provide other services. Some, for instance, offer translations; others provide special processing such as editing transmissions for content or mailing multiple copies of a transmission for distribution to numerous trading partners. Clearly, using the VAN as a vehicle for communicating with business trading partners is the configuration most preferred by U.S. companies.

1.4.6 What Are the Benefits?

The benefits of EDI extend far beyond a decrease in paper: more accurate records, lower data entry costs, elimination of mailing costs, decreased paper handling, greater customer satisfaction, reduced inventory, better cash management, reduced order time, and more accurate information for management.

1.4.6.1 More Accurate Records

Initially, when information is entered into a computer system, say, by keypunching, the software edits it to ensure accuracy. Editing will typically give an error message if, for example, the account number or part number is not valid or if the price is incorrect. With the massive amounts of data being exchanged today, some errors are going to occur when a manual entry process is used. Such data entry errors can be very costly. If an invoice is authorized for a \$1,000 payment instead of a \$100 payment or if an order is filled to ship 100 items instead of 10 items, time and money are wasted trying to discover and correct the error. Even if 98 percent of the information entered manually is accurate, the 2 percent that contains errors can be embarrassing (e.g., a customer's name may be misspelled) or costly (e.g., undercharging) a customer.

EDI ensures greater information accuracy by exchanging data directly between computer systems. A major freight carrier indicated that one EDI client transmitted 600,000 freight bills electronically in a span of 18 months with absolutely no errors. For that client, the elimination of errors alone paid for the cost of developing an EDI system.

1.4.6.2 Lower Data Entry Cost

Nothing is more inefficient than manually keyboarding data from one computer printout into another computer system. EDI eliminates the need to reenter such data. With most communications packages today, information can be uploaded and downloaded (i.e., passed to another computer program without being rekeyed) directly. EDI installations report that they have transmitted 10,000 documents (i.e., invoices) accurately within minutes and processed them immediately with no human intervention.

1.4.6.3 Reduced Inventory

Timely processing of information allows suppliers to know what material to ship and when to ship it instead of having to estimate when and where the material is needed. One company was able to reduce its inventory by \$167 million in the first 18 months it was involved in EDI. That company not only saved the cost of carrying that inventory but was also able to reduce the amount of outside warehouse space it needed.

Inventory reductions through EDI are not limited to the user; suppliers, too, have been able to reduce their inventories. Companies using EDI can transmit accurate and timely information on the exact time they need supplies rather than having all supplies for the month being due on the first day of the month. Suppliers have learned to trust the EDI information transmitted and plan the receipt of the material and production runs based on true need, not guesswork or urgent phone calls. A manufacturer *and its suppliers*, for example, have been able to reduce inventories by as much as 80 percent.

1.4.6.4 Decreased Mailing Costs and Paper Handling

Mailing an order is costly and inefficient. When the cost of typing the order, addressing the envelope, and inserting the order into the envelope are added to the cost of postage, a single order can cost \$5 or more. When many orders are sent or received each year, the costs accumulate. Sending those orders in an overnight package adds another \$5 to \$10. Many EDI installations have been justified merely by the savings in mailing and handling costs.

When the information from and to each trading partner is transmitted electronically, the mounds of paper that were previously moved from one department to the next in the company can be eliminated. Information on an order or an invoice is stored in the computer, ready to be processed into the order entry system or accounts receivable system. Instead of filing a piece of paper, a computer image can be processed directly onto microfilm or other media, thus meeting the standard audit requirement of maintaining a copy for record purposes.

Many private-sector firms use the remittance/payment advice to electronically apply cash to an invoice number. One check may pay thousands of invoices. To post the payment information to a record manually may take hours, whereas with EDI, it can be done in minutes and without error.

1.4.6.5 Greater "Customer Satisfaction"

With an efficient EDI system, an order can be received, processed, and shipped almost as quickly as it can be transmitted. Many companies use EDI to buy such material as office supplies, sandpaper, work gloves, and other items not used directly in their production process. They send the order electronically and the goods are shipped immediately. Many freight carriers let their customers look at the carrier's computer information to help locate information about a customer's shipments. This adds to the customer satisfaction by enabling shipments to be located more quickly and efficiently.

1.4.6.6 Reduction in Order Time

Often, in submitting and receiving an order, as much as a week or more is consumed by mailing and handling time. One-day handling of paper on both ends and 2 to 3 days in the postal system means that the use of EDI can eliminate almost a full week of order time. With EDI, we can in many cases order goods and have them shipped the same day.

1.4.6.7 Better Cash Management

By taking advantage of EDI, companies can control the purchase of the right material at the right time and thus better plan their cash disbursements. When EDI is used to transmit an invoice or an advanced shipping notice for use in an evaluated receipt settlement (ERS) system, the invoice is handled with consistency and no guesswork is needed to know when it will be paid. That consistency allows for much more efficient cash management.

With the use of electronic funds transfer (EFT), both parties can better plan the use of the funds.

A paper payment check may arrive anywhere from 2 to 4 days after it is mailed — that time is referred to as the float. With EFT, the money arrives on the day on which it is planned to arrive. With a consistent flow of money, the use of that money can be more efficiently planned.

The issue of float — the time from issuance of a check to the time it is deposited in an account — however, needs to be neutralized. In today's paper world, the real terms are not "net 10 days" as they appear but rather "net 10 days plus float," or the time the check is in the mail and has not been deposited. The money leaves one bank account and actually enters another in 13 days rather than the 10 days that the payment terms state. With EDI, payment terms need to reflect the "real" terms — and everyone wins because both parties can better plan when money will enter and leave an account.

1.4.6.8 More Accurate Information for Decisions

The availability of accurate information permits an organization to accelerate its ability to identify problem areas and to highlight areas with the greatest potential for efficiency improvement or cost reduction. Better information about shipping charges, inventories, sales orders, shipment dates, invoice amounts, or cash flow is the keystone for more efficient operation. Continuous knowledge of the exact whereabouts of inbound freight, for example, enables more accurate scheduling of the receiving dock and in many cases better scheduling of the production floor.

1.4.7 How Do I Get Started?

Now that we know what EDI is, what resources are needed for EDI, and what some of the good business reasons for using EDI are, the next step is, "How do I get started sending messages electronically?"

You need to start by reviewing your internal systems. Each ANSI standard or convention is introduced with the following words:

This standard was developed with the intent that users need not reprogram their internal data processing systems. The standard is structured to allow computer programs to translate internal formats to the data transmission standard, and conversely, data received for processing to internal systems. Software to translate data to and from the standard's format may be user developed or commercially purchased.

If you can process the information in paper form today, you should have an easy time converting to EDI. You may discover some efficiencies can be realized by changing your internal system, but you do not have to change it to conduct business electronically. You may also consider undertaking some or all of the steps outlined in the following subsections.

1.4.7.1 Education

A seminar on EDI will expose you to what others are doing and help you "sell" the idea of EDI in your company or activity. Many educational programs are available from which to choose: the Automotive Industry Action Group, the National Industrial Transportation League, the American Trucking Association, the Electronic Data Interchange Association, ASC X12, and VANs, to name just a few. Attend one; it is a chance to talk to others about EDI.

1.4.7.2 Establish a Project Team

The private sector has found that the team approach to EDI is highly successful. All the disciplines of the company need to be represented on the team, and a project leader needs to be selected to help coordinate the meetings and the EDI projects.

Some EDI projects may involve only selected departments, but others will cross several disciplines. Share the information at the meetings and provide the minutes of those meetings to as many people as possible. They will help others learn what you are doing.

Involve your financial people as early as possible. Once they are tuned-in to EDI, they may become your strongest supporters.

Discuss the various aspects of EDI at your project team meetings. What types of EDI do you want to do? What standards could you use? Would a third-party network help? What resources do you need? What standards are already being used in your company or industry?

Use these meetings to help educate your organization about EDI. Bring in outside experts, use internal experts, but gather the facts and communicate the results.

1.4.7.3 Develop a Plan

A corporate strategy should evolve from these discussions. Each discipline should submit a summary of projects to which it will apply EDI, and those projects should be officially included within the discipline's budget plans. If any individual project has no payback, that project may need to be reevaluated. EDI must be applied for good business reasons, not just for the sake of applying EDI.

Internal systems may contain all the information you need to send efficient EDI messages, but some information may be in the wrong files. When getting started, do not try to make too many changes at one time. If the appropriate information can be printed on a piece of paper, it can also be translated for EDI.

If a piece of information does not translate easily, do not immediately revise your system. Perhaps a note (NTE) segment will get you by until sufficient business reasons exist for updating your internal programs. If the existing codes do not meet your

circumstances, submit a change request through your activity to the ASC X12 Data Interchange Standards Association (DISA).

Your plans should be discussed with all disciplines involved, including systems, accounting, auditing, legal, and transportation.

Reach consensus on your long-term goals and establish individual tasks that move you toward those goals. Assign to individuals the responsibilities to complete the tasks.

Keep in mind that successes are needed to keep the team motivated; publish all successes. The more you make the entire organization aware of the successes, the more others will give their support.

1.4.7.4 Conduct a System Analysis

Your goals should include developing answers to the following questions:

- What documents will be sent, using what standard formats?
- Who are your trading partners and in what order will they be brought onboard?
- Which trading partner will you select for the pilot test of your EDI system?
- When will systems resources be available?
- Do you develop your own communications network or select a third-party network?
- Do you purchase software or write your own?

Study the alternatives discussed in our earlier Section 1.4.4 on what resources are needed.

The EDI systems entail some communications costs. Who assumes those costs varies from industry to industry and company to company. When compared with the overall savings produced by EDI, these costs often are insignificant. In the automotive industry, the supplier typically pays for sending and receiving EDI (i.e., phone charges or third-party network charges). In other industries, the sender of a message may pay the costs or the sender and receiver may split them evenly. Review your industry practice and establish an organizational position that best fits your needs.

1.4.7.5 Coordinate Your Plans

Let your trading partners know what you will be doing well in advance. They will need to make some of the same changes you are making. Inquire about their level of EDI readiness; they may be ready and just waiting for you to say something.

Train as many people in your organization as you can on what you are doing and why. Training always pays off in the long term. The more people that understand the process, the better chance you have for success.

Be sure to let your purchasing department know what you are doing. In many cases, they will be the first ones your trading partners will call with questions. Make sure they know who can answer additional questions.

1.4.7.6 Choose Your Partners Wisely

In choosing a trading partner for a pilot test of your EDI system, select someone you may have met at an EDI conference who is already experienced or ask your managers whether any suppliers or customers have expressed interest.

In the pilot test, you can learn what processes, procedures, and operations need to be worked out — something you may have left out or did not fully understand.

The more your trading partners know about what you will be doing, the happier they will be about using EDI with you. Let them know what you want to do and when you want them to do it. Remember when you were being asked to support EDI? Give your trading partners 60 to 90 days notice or more. They will need to make many of the same evaluations you did when you started your EDI project.

Carefully select a group of trading partners that will benefit the most from your EDI approach. If the EDI project will not benefit the trading partners, they may choose not to participate. Do not forget that the selling job you had to do in your own organization must now be done in your trading partner's. Each partner needs to allocate resources for EDI.

The easiest way to determine which trading partners are most willing to participate in EDI with you is the same way you determined what documents to use first: volume. The trading partner that sends you the largest number of invoice line items is the one that will gain the most from your electronic invoice or ERS system. The one that sells you the largest number of parts is the one to gain the most from an electronic material release or schedule.

1.4.7.7 Expand Your Project Through Conferences

Twenty to forty suppliers at each conference is a good number. The conference will give them a chance to discuss the issues with you in more detail. Provide them with a handout detailing all the information they will need to support your EDI project and ask for their feedback.

You must be ready for some setbacks. Perhaps you forgot to inform a key individual. Perhaps a key element in the plan is not ready or has not tested successfully. Focus attention on the problem and find the solution.

1.5 HOW TO USE THE IMPLEMENTATION GUIDELINES

The main topics and structures of this document conform to the *EDI Implementation Reference Manual Guidelines* document that was developed by a task group of the subcommittee on education and implementation of the ASC X12. The purpose of having agreed-upon topics and structure is to facilitate reference by the many industry and DoD personnel who are involved in implementing the uniform standards for electronic interchange of business transactions.

The guidelines are divided into chapters. Chapters 1 through 9, found in Volume I, contain both functional and technical guideline information that is relatively stable. Chapter 10, found in Volume II, contains the specific conventions for using ASC X12 standards; those standards are subject to periodic updating and will be expanded as new conventions are added.

1.5.1 Guidelines, Standards, and Conventions

The terms guidelines, standards, and conventions are used throughout the document and are defined as follows:

- *Guidelines* are instructions on the use of EDI. They provide additional information to assist in conducting EDI. Guidelines are intended to provide assistance and should not be your sole source of information.
- *Standards* are the technical documentation approved by ASC X12; specifically, transaction sets, segments, data elements, code sets, and interchange control structure. Standards provide the structure for each ASC X12 document.
- *Conventions* are the common practices and/or interpretations of the use of ASC X12 standards. Conventions define what is included in a specific implementation of an ASC X12 standard.

1.5.1.1 Who Develops the Conventions?

Conventions result from a joint effort between business, technical, and an EDI ASC X12 standards experts. The business data requirement is defined, a transaction set is selected, and the data requirement is then identified with data elements in the transaction set. A convention is usually developed before any computer systems development work and serves as a design document when the development process begins.

1.5.1.2 Why Use a Convention?

To create an ASC X12 transaction, a user must know the data requirements, understand the ASC X12 standard, and be able to use that information to develop an interface program between the computer application and the ASC X12 translator. The necessary information to perform this task is contained in the convention document. Users who follow the convention will create a transaction set that all DoD users understand.

1.5.1.3 Who Needs a Convention?

System analysts and applicaiton programmers who plan to create or read ASC X12 transactions should use a convention to aid in interface software design. The convention will help the programmer and analyst identify where their application data requirement should be carried in an ASC X12 transaction set.

1.5.1.4 Do I Develop a Convention?

Conventions already exist for some of the most common business practices. Copies of existing conventions can be acquired through your organization's EDI coordinator at the start of an EDI project. If you find no conventions for the business practice you are about to implement, your EDI coordinator should contact the DoD Executive Agent for EDI. See Chapter 5, *Maintenance*, for the point of contact.

1.5.2 Page Numbering

Chapters 1 through 9 and Sections 10.1 through 10.6 use the following page-numbering scheme:

Chapter number; page number: for example,
page 5.0.1 is the first page of Chapter 5.0.

Chapter 10.7 is composed of multiple sections (one for each transaction set) and is numbered to reflect the transaction set number and version.

Transaction set no.; version control no.; page
no.: for example, 810.002002.19 is the
nineteenth page of the section on transaction set
810, version 002, release 002.

This permits the maintenance of multiple versions of the same transaction set during a transition period.

1.5.3 Documentation of Industry Conventions

Conventions are adopted from, and are intended to be in conformance with, ANSI ASC X12 standards or ASC X12 Draft Standards for Trial Use (DSTU).

Figure 1.5-1 is an extract from Chapter 10, Section 7 and provides an example of a transaction set. The transaction set defines information of business or strategic significance and consists of a transaction set header segment, one or more data segments in a specified order, and a transaction set trailer segment. The actual ASC X12 standard as it appears in the official ASC X12 standards manual is presented on the right side of the page. This standard also includes both syntax notes and comments. The specific industry usage designator and notes are presented on the left side of the page.

The designation "use" appears in the left column if the industry uses the specific segment and remains blank if the industry does not.

ASC X12.2 Transaction Set 810
Invoice (Version 002003)
Segment Hierarchy

Table 1 - Header Area

Industry	Seg ID	Name	Req Des	Use	Loop
USE	ST	Transaction Set Header	M	1	
USE	BIG	Beginning Segment for Invoice	M	1	
USE	NTE	Note/Special Instruction	F	100	
USE	CUR	Currency	O	1	
USE	REF	Reference Numbers	O	12	
USE	PER	Administrative Communications Contact	O	3	
USE	N1	Name	O	1 N1\200	
USE	N2	Additional Name Information	O	2	
USE	N3	Address Information	O	2	
USE	N4	Geographic Location	O	1	
USE	REF	Reference Numbers	O	12	
USE	PER	Administrative Communications Contact	O	3	
USE	ITD	Terms of Sale/Deferred Terms of Sale	O	5	
USE	DTM	Date/Time Reference	O	10	
USE	FOB	F.O.B. Related Instructions	O	1	
	PID	Product/Item Description	O	200	
	MEA	Measurements	O	40	
	PWK	Paperwork	O	25	
	PKG	Marking, Packaging, Loading	O	25	

Table 2 - Detail Area

	Seg ID	Name	Req Des	Use	Loop
USE	IT1	Baseline Item Data (Invoice)	O	1 IT1\200000	
	CUR	Currency	O	1	
USE	IT3	Additional Item Data	O	5	
	TXI	Tax Information	O	10	
	CTP	Pricing Information	O	25	
USE	PID	Product/Item Description	O	1000	
USE	MEA	Measurements	O	40	
	PWK	Paperwork	O	25	
	PKG	Marking, Packaging, Loading	O	25	

Figure 1.5-1 Example of a Transaction Set

1.5.3.1 Transaction Set Hierarchy

The transaction set hierarchy shows which segments may be used in a transaction set and the proper sequence of those elements within the transaction set.

A segment directory contains the definitions and formats used by the industry in the construction of each particular transaction set. This segment-by-segment description permits the reader to examine the specific usage of each data element and segment in the transaction set.

Terms and definitions

- *Level*

The level indicates whether the segment is used at the Header (Table 1), Detail (Table 2), or Summary (Table 3) level of the transaction.

- *Segment Requirement Designator (Req Des)*

The following definitions are for use in interpreting the segment requirement designators in the industry-specific *Segment Directory* section of the guideline.

- › *Mandatory*

Mandatory segments are defined by ASC X12.

- › *Optional*

The use of optional segments is determined by the trading partners.

- › *Required*

A required segment is considered optional under ASC X12 rules but is required by industry decision.

- › *Recommended*

Recommended segments are considered optional under ASC X12 rules and by the industry, but the industry recommends their use to facilitate EDI. Most companies in the industry are expected to use this segment.

1.5.3.2 Transaction Set Segment

Figure 1.5-2 is an example of a transaction set segment.

Industry usage is specified on the left side of the page. Between the two sides of the page is a narrow column for designating an industry variation from the ASC X12 standard. The "<" symbol is used to draw attention to the deviation.

For identifier (ID) — type data elements, acceptable code values are listed on the right side of the page under the definitions of the element. When ID elements are not used by the industry, definitions of the data do not appear. Large or repeated code lists may be included in a separate section and referenced.

Segment: **BIG** Beginning Segment for Invoice
 Level: **A**
 Usage: **M**
 Max Use: **1**
 Loop: **0**
 Purpose: To indicate the beginning of an invoice transaction set and to transmit identifying numbers and dates.
 Comment: A. BIG07 is used only to further define the type of invoice when needed.

Data Element Summary

Ref. Des.	Data Element	Name	Attributes
BIG01	245	Invoice Date Invoice Issue Date.	M DT 6/6
BIG02	76	Invoice Number Identifying number assigned by issuer.	M AN 1/22
BIG03	323	Purchase Order Date	O DT 6/6
BIG04	324	Purchase Order Number Identifying number for Purchase Order assigned by the orderer/purchaser.	O AN 1/22
BIG05	328	Release Number Number identifying a release against a Purchase Order previously placed by the parties involved in the transaction.	O AN 1/30

Invoice Date
[003 A]

Invoice Number
[004 A]

Required

Purchase Order Number
[005 A]

This element carries the Government contract number. Contractors when dealing with their vendors will use code "CT" with the "REF" segment.

Release Number
[006 A]

This element carries the call/order number.

Figure 1.5-2 Example of a Transaction Set Segment

Industry notes may appear on the left side of the page or after the last data element of the segment.

The following definitions are for use in interpreting the data element requirement designators in the industry-specific segment directory section of the guideline. For ASC X12 usage, see the definitions in *X12.6 Application Control Structure*.

- *Mandatory*
Mandatory data elements are defined by ASC X12.
- *Optional*
Optional data elements are used at the discretion of the sending party or are based upon mutual agreement between trading partners.
- *Required*
Required data elements are considered optional under ASC X12 rules, but are required by industry decision.
- *Recommended*
Recommended data elements are considered optional under ASC X12 rules and by the industry, but the industry recommends their use to facilitate EDI. Most companies in the industry are expected to use this data element.
- *Not Used*
"Not Used" data elements are those that the industry does not use.
- *Conditional*
Conditional data elements depend on the presence of other data elements in the transaction set.

2.0 BUSINESS ISSUES

This chapter provides guidelines for the successful implementation of ASC X12 EDI standards in your organization. It addresses transaction timing, modes of operation, security, recovery, and audit considerations.

2.1 IMPLEMENTATION CONSIDERATIONS

EDI is not an insignificant task. It is intended to change the way you do business and will affect many areas of your organization's support and operational mission. Top management must be involved in the approval phases of the project to ensure the availability of adequate funding and personnel for the project and support for the affected organizational areas. Requirements for projects may vary from one organization to another; very large projects should use life cycle management (LCM), while smaller projects may only need one or two full-time personnel. In either case, you should adhere to the following general rules for a successful project.

- EDI is a solution to a business problem and must be treated as a business issue. You need a plan that clearly defines the scope of the project and methods for carrying out an organized effort to achieve specific business objectives.
- Do not deviate from the published standards. Deviations will require you to customize your system and will increase cost in the long run as trading partners are added and standards change.
- Make the transition to a full production system only after your system has proved itself.
- Conduct integrated system testing to ensure the existing systems you are interfacing with are operating properly.
- Do not forget internal controls and the need to provide an audit trail of EDI activity.
- To obtain the highest payback from your EDI system, integrate it into your internal systems and business procedures.

2.1.1 Staffing Requirements

EDI projects differ from traditional internal automation projects in that planning, development, and implementation tasks must be performed by organizations outside DoD's authority and control, which adds an additional level of complexity to the project manager's tasks. To offset this control problem, a senior EDI manager should be appointed at a grade level that will facilitate coordination at the corporate level.

Implementing EDI projects involves many people in a variety of roles. Such projects require a great deal of coordination between the functional managers and the automation managers. At a minimum, the EDI project should have the following staff:

- Senior manager
- Project manager
- Functional coordinator (for each business area impacted)
- Technical coordinator
- EDI coordinator
- Contract administrator.

For a small EDI system, some of those staff positions may be combined. For larger systems, all personnel may be required full time.

During the project, it may be necessary to establish support groups to assist the project team. The following groups are suggested:

- *Operations Group* - includes functional coordinators to develop the business plan.
- *Liaison Group* - includes technical and functional coordinators to manage standards and procedures with organizations outside DoD.
- *Technical Group* - includes analysts with a detailed knowledge of the interfacing systems, communications, computer operations, and operating system software.

Again, for small projects, the operations of these groups may be combined.

2.1.2 Implementation Checklist

The following 16 subsections specify actions that you should take when implementing an EDI program.

2.1.2.1 Obtain a Commitment From Management

Identify key management personnel from all organizations that will be affected by the implementation. Each identified organization should be included in the analysis, development, testing, and implementation.

2.1.2.2 Establish a Plan

Use project management tools to develop a work plan, identifying as many tasks as possible. Provide resource estimates and estimated completion times where possible. Prepare a milestone schedule and identify potential savings. Brief management on the plan.

2.1.2.3 Establish a Project Team and Define Responsibilities

Construct a responsibility matrix. List the tasks to be performed across the page (vertical component) and the team members down the page (horizontal component). Determine whether you have enough people to implement the EDI program. Also see whether certain tasks will require someone not previously identified. You must be specific about deliverables expected from each task.

2.1.2.4 Establish EDI Contacts

Contact organizations that have implemented ASC X12 EDI standards. Industry associations and network providers are a good source of information.

2.1.2.5 Review Internal Systems and Operational Procedures

You must conduct a system analysis of the processes that create the business data you need and document the flow. Work-place procedures must be reviewed and documented.

2.1.2.6 Obtain Appropriate Reference Materials

Obtain copies of the ANSI ASC X12 publications, related training materials, and industry implementation guidelines. You will need access to data dictionaries and documents that define functional codes.

2.1.2.7 Survey Potential Trading Partners

You will need to know the level of experience of your trading partners, resources they have available, whether their systems are automated, and what kind of communication system they are using.

2.1.2.8 Review the Business Data You Wish to Exchange

Thoroughly review or map your business data against the DoD conventions of ANSI ASC X12. By so doing you will be able to determine whether your internal system contains all the required/mandatory data elements. You should identify optional data elements and discuss them with your trading partners.

2.1.2.9 Develop an Overall Design

Using the information you have collected, prepare a detailed system integration plan that identifies the following items:

- General narrative
- Functional description
- Data requirements and data flows
- System specifications
- Program specifications
- User procedures
- Computer operation procedures.

2.1.2.10 Develop a Communication Plan

Discuss this plan with your trading partners. You should develop this plan early since it will influence other decisions such as maintaining connection, coordinating the polling schedules, providing audit reports, and sharing costs.

2.1.2.11 Code and Test the Interface from the Internal Systems to the Translation Software

The EDI translation software configuration is dependent upon your system design. In all but in-house-developed software, translation software must interface with your internal application systems and communication system.

2.1.2.12 Install Translation Software

Translation software must be configured to run in your system environment (unless you are using a network-based translation). Tables must be updated and modified to support your applications.

2.1.2.13 Install Communications

No matter which communication alternative you have chosen, some installation task will be required.

2.1.2.14 Conduct an Integrated Test of All Components

Conduct an integrated test of all components to verify that the system can perform the following tasks:

- Generate data from the internal system
- Translate the data into ANSI ASC X12 format
- Assemble and transmit the ANSI ASC X12 formatted data
- Receive transmissions
- Translate the ANSI ASC X12 format to the internal system format
- Generate and send an acknowledgment.

2.1.2.15 Conduct a System Test With Your Trading Partner

Conduct extensive system testing prior to actual production. Parallel testing with the old system to validate the transmissions should occur for a predetermined time period. Develop an agreement document that includes all participants in the project and have everyone sign it before production begins. Make sure all contract agreements have been signed.

2.1.2.16 Determine Initial Operational Capability (IOC)

Initial production should be limited to one or two trading partners and one or two different transaction sets. You should predetermine a time period for IOC that can be used to validate assumptions about cost savings and to adjust your implementation plans prior to expanding to other trading partners.

2.2 TIMING OF TRANSACTIONS

The timing of transactions is critical to the smooth flow of work and directly affects the network transmission cost (off-hours cost less). The data flow requirement has been documented during the analysis phase of the project and should be described in enough detail to optimize data needs and transmission cost.

Business issues must also be considered. You must address such issues as when to release the EFT (or other payment method) and when to time stamp a response to a request for quotation. These issues are discussed in Section 3.4, *Trading Partner Agreements* (TPAs) and in Section 7.1, *DoD Business Models*.

2.3 MODES OF OPERATION

You can operate your EDI system in two modes: test and production. When the interchange becomes production is a decision that must be agreed upon by all participants. Prior to that time, all interchanges are coded as "T" (test data) in the interchange control header. Production interchanges are coded "P".

2.4 SECURITY

DoD Components must employ risk management techniques to determine the appropriate security controls needed to protect specific data and systems. Optional tools and techniques for implementation of security and authentication provided by ASC X12 may be used consistent with the security risk. For example, the interchange control header (ISA) segment offers the capability of password protection.

Security precautions taken to protect EDI data and transmissions should be at least as good as those currently employed for the paper exchange.

The security of unclassified/sensitive systems is a concern and the Office of the ASD (P&L) has established a program titled "Protection of Logistics Unclassified/Sensitive Systems" to address the issues. The results of a prototype project to test and assess commercially available and affordable products demonstrated convincingly that protection can be achieved by combining the speed of a Data Encryption Standard (DES) with the advantages of Public Key Cryptography (PKC) for key exchange. The PLUS program seeks to provide low-cost procedures that will ensure the protection and authentication of EDI transmissions from anywhere in the world, using public telecommunication carriers, in the clear or encrypted. In addition, the PLUS program will provide for digital signatures, including nonrepudiation attributes where required. The security afforded by developing technology will support compliance with the Computer Security Act of 1987 (P.L. 100-235). A joint task group (Production and Logistics Task Group for Data Protection) has been established to provide guidance for the implementation of the PLUS program initiatives. The ASC X12 Security task group is also defining how PKC will

be specified in the X12.42 Cryptographic Message and X12.58 Security Structures Standards.

2.5 RECOVERY PROCEDURES

DoD Components should establish back-up procedures to provide for retransmitting EDI messages.

- Back-up and recovery procedures should be available for use if computer systems or transmission fails.
- A maximum number of attempts or retransmissions following a text transmission error should be established, to minimize communications costs for bad connections.
- For real-time transactions, such as the advance ship notice and shipping schedule, a minimal 24-to-48 hour immediate-access backup should be available.
- Batch transactions, such as those used for the purchase orders and invoice, require a 1-to-2-week minimum-access backup.
- Some type of archive storage in which the data are backed up and stored on a more permanent basis should be available. The permanent archives and supporting system should provide for recovering a specific EDI message from the archives and retransmitting it.

The back-up and recovery system must be thoroughly documented to allow anyone with the proper authority to access the system to retransmit data.

The Functional Acknowledgment (997) Transaction Set can be used to provide a level of automation in the back-up and recovery area. If the EDI system expects to receive a functional acknowledgment for every transaction it sends, the EDI message should be available for retransmission until a functional acknowledgment corresponding to a specific EDI message is received. Once that functional acknowledgment is received, the original EDI message can be archived regardless of the normal archive timing.

The system could be designed to provide a degree of flexibility. The use of functional acknowledgments could then vary on the basis of business requirements. It may be appropriate to send/receive functional acknowledgments by trading partner, transaction, some combination of the two, or some other variable unique to your EDI requirements.

If a third-party network is used, additional costs will be assessed to send and receive functional acknowledgments. Your level of risk must be known when considering whether the additional costs of including a flexible functional acknowledgment component in your EDI system and sending and receiving functional acknowledgments are justified.

2.5.1 Recovery Procedure Considerations

You should establish recovery procedures to allow for controlled management of unusual telecommunications problems. The following are some potential problems that should be managed by the EDI system:

- A trading partner's computer that won't answer when your computer calls to pick up or deliver EDI messages.
- A bad connection that causes continuous or excessive numbers of retransmissions.
- How to notify someone when a predetermined threshold number of errors are encountered.

2.5.2 Disaster Recovery Considerations

Disaster recovery becomes correspondingly critical as the amount of business that is conducted through EDI increases. Consider the consequences if you were suddenly unable to telecommunicate for some period of time — say, a week.

You should not assume that you can fall back on a paper-based system. Your trading partners may not be able to quickly switch from EDI messages to mailing their business transactions to you. You may not have immediate access to the resources in your organization needed to process paper transactions.

Develop a plan to deal with extreme problems, such as a total loss of a data center or computer system or a loss of a telecommunications switch station servicing your area.

2.6 AUDIT CONSIDERATIONS

The elimination of paper document processing through the introduction of ASC X12 EDI standards requires an evaluation of your existing internal control processes and procedures. Without a signed document and paper audit trail, how can you determine whether a transaction is accurate, valid, and approved?

This problem is not a new one. All application and telecommunication systems have been addressing this type of problem for many years and the same elements of control apply in EDI as they do in other automated systems.

Controls are applied to ensure the following:

- *Confidentiality* — Only authorized persons have access to the data.
- *Integrity* — Data accuracy.
- *Authenticity* — These are actual or real transactions that belong to you.

Controls can be applied at different levels and directed to specific threats. These can be categorized as follows:

- *Passive Threats* – unauthorized persons have access to and can use information they have no right to.
- *Active Threats* – unauthorized persons received information they have no right to and made changes to the data to their advantage before passing the information on for processing by the rightful owners.
- *Human Errors* – errors that occur throughout the cycle of any information flow when human intervention is required.

2.6.1 Confidentiality

Some examples of how you can ensure confidentiality of your EDI transmissions are as follows:

- *Encryption* – a method of logically scrambling the EDI information with an encryption key and giving the key only to persons who have a right to that information. The key is an electronic code for this procedure.
- *Passwords* – used to control browsing of files. Passwords should be changed often for maximum effect.
- *Stand-alone computers* – used in place of a company main computer to interface with other companies. The EDI information can then be uploaded to the main computer for use in applications.
- *Local delivery* – a control by which goods purchased at a location can be delivered only to that location.

2.6.2 Integrity

Integrity of the information is extremely important in EDI because the same data are used many times in the interchange process. EDI is at its best when data are validated at the front end of the process so they are correct for the rest of the steps in the process.

- Senders of EDI data should satisfy themselves as well as the receivers that they have imposed adequate controls to ensure that data at the beginning of the process have a good chance of being correct.
- VANs provide additional controls, such as checking for alpha characters in a numeric field and looking for the existence of critical data fields.
- ANSI X12 standards provide controls, such as the functional acknowledgments and various record and segment counts.
- Conversion tables must be updated to ensure adequate conversion to the user's codes. If one party in the interchange

receives someone else's information in error, a large number of mismatches will probably occur on normally valid table look-ups.

- By creating mechanized trend or exception reports which compare current data with those of a past period, you can detect significant variances.

2.6.3 Authenticity

The parties to data interchange can be certain that the transactions being received are the "real thing" in several ways:

- By using controlled, authorized, trading-partner codes. This process and other areas of agreement should be clearly spelled out in the signed trading partner agreement. Trading partner agreements are an important tool in the control and accountability of EDI.
- By comparing user codes to a list of valid codes before transactions are accepted.
- By using a password to provide user codes a double level of protection.
- By retaining the file that contained the data separately once data has been transmitted to prevent a retransmission of the same data. These files may be needed for backup if a valid retransmission is required.

3.0 LEGAL CONSIDERATIONS

This chapter explains the legal implications of implementing EDI. In it, record keeping, authentication, TPAs, third-party service agreements, laws, rules, and regulations are discussed.

3.1 INTRODUCTION

The use of EDI is on the verge of an explosion. At first blush, it might appear to the uninitiated that computer-to-computer transfer of business and logistics documentation in a machine-readable form will never fit within the strictures of the Defense Department's laws and regulations. Nonetheless, EDI is now being used in the Department of Defense and its use will grow exponentially in the near term.

The development of the law regarding EDI when compared with the development of computer technology is quite sluggish even in the private sector. It is even slower developing in the public sector. That growth is not unusual, however, since the law develops relatively late when compared to the rapid growth of technology in most fields. The precise legal status of EDI transactions is somewhat uncertain. Yet those uncertainties have not posed a significant obstacle to adoption of EDI in private industry. Similarly, they should not do so in the Defense Department.

We do not suggest that EDI systems be implemented within DoD with legal impunity. On the contrary, legal counsel should become part of the EDI team from the conceptual, or planning, phase. Most current law on paper transactions can be transported into EDI transactions with little risk. Courts and Boards are very comfortable in handling disputes involving traditional paper agreements. Contracting officers and audit and financial officials are similarly comfortable with paper documents and are naturally reluctant to step into the somewhat uncharted waters of electronic transmissions. Legal counsel, with a positive attitude toward improving productivity in an era of shrinking defense budgets, can provide invaluable service in implementing EDI efficiently while minimizing the legal risks to DoD. EDI is a tool that can efficiently perform the millions of daily DoD transactions and one that can save scarce resources and improve service at the same time.

This chapter outlines guidance to DoD acquisition and logistics personnel on the legal considerations in implementing EDI. It deals with pertinent Federal statutes, the Federal Acquisition Regulation (FAR), and the DoD FAR Supplement (DFARS). The attitude of modern day Courts and Boards toward computer-generated documents is discussed. Record keeping, TPAs and third-party network agreements, and associated legal issues are also discussed.

3.2 FEDERAL LAW AND REGULATIONS

Literature in trade papers and legal journals is proliferating rapidly in terms of EDI legal issues, especially in private industry. Much discussion is centered around the legal requirements of the Uniform Commercial Code dealing with commercial law between private contracting parties. Much of the discussion treats the requirement for the sale of goods exceeding a certain amount, typically those sales exceeding \$500. Such sales are required to be in writing and signed by the party to be bound (Uniform Commercial Code, Section 2-201). Further discussion invariably involves the signature or authentication requirement.

Federal officials should be familiar with these critical, timely issues but should be mindful that the Uniform Commercial Code is not Federal law and, therefore, it is not legally binding in Federal acquisitions. Many times in the absence of Federal judicial precedent, attorneys argue the Code's principles for persuasion, but judges on the Federal Courts and Boards feel no obligation to accept the argument.

The DoD contracting officers may not conclude that EDI transactions may be accomplished in an unfettered fashion. In fact, Title 31 of the United States Code, Section 1501, specifies certain writing requirements before public money shall become an obligation of the United States. It states:

An amount shall be recorded as an obligation of the United States Government only when supported by documentary evidence of -

- (1) A binding agreement between agencies and another person ... that is -
 - (a) In writing, in a way and form, and for a purpose authorized by law; and
 - (b) Executed before the end of the period of availability for obligation of the appropriation or fund used for specific goods to be delivered, real property to be bought or leased, or work or service to be provided;
- (2) A loan agreement showing the amount and terms of repayment;
- (3) An order required by law to be placed with an agency;
- (4) An order issued under a law authorizing purchases without advertising -
 - (a) When necessary because of a public exigency;
 - (b) For perishable subsistence supplies; or
 - (c) Within specific monetary limits;

- (5) A grant or subsidy payable -
 - (a) From appropriations made for payment of, or contributions to, amounts required to be paid in specific amounts fixed by law or under formulas prescribed by law; ...
- (6) A liability that may result from pending litigation;
- (7) Employment or services of person or expenses of travel under law;
- (8) Services provided by public utilities; or
- (9) Other legal liability of the Government against an available appropriation or fund.

Does this mean, for example, that all DoD contracts must be in writing and in hard copy to be legally enforceable? Some Federal financial officials have espoused the position that this law constitutes a recording statute binding only on the financial community and not on the procurement community. That view seems to beg the question. As a matter of fact, in an important Federal Court case involving a similar law (predecessor statute), Government attorneys urged upon the Court that "the statute is simply a recording statute to facilitate auditing and has no effect on government contracts with private parties." The Court rejected the argument and found an oral contract unenforceable (United States v. American Renaissance Lines, Incorporated, 494 Federal Reporter, 2nd series, 1059).

In that case, the Court was dealing with a purported oral contract. We cannot overemphasize that when EDI transactions are properly executed, they are much more than an oral contract. EDI transactions can possess whatever built-in reliability and security their importance and size warrants. Therefore, Courts and Boards should not be reluctant to enforce them.

The above-mentioned statute (31 USC§1501) requires different levels of documentation: most notable are small purchases and other purchases that do not require advertising. Most EDI purchasing systems in DoD rely upon one or the other of these exceptions for their legality. DoD could conceivably purchase as much as 90 percent of its supplies under these exceptions.

This practice of DoD limiting pilot and test EDI programs to small purchases should not be construed as an implicit concession that EDI transactions *per se* do not comply with the "in-writing" requirement of the statute. A convincing argument can be made that a carefully drafted TPA plus the EDI documents themselves constitute a writing and can be executed so as to comply literally with the statute. (TPAs are discussed subsequently in this chapter.)

In addition to the Federal law mentioned above, the FAR must be considered. FAR 2.101 defines a contract as:

A mutually binding legal relationship obligating the seller to furnish the supplies or services (including construction) and the buyer to pay for them. It includes all types of commitments that obligate the Government to an expenditure of appropriated funds and that, except as otherwise authorized, are in writing.

There are authorized exceptions. FAR Part 13, for example, authorizes oral orders for calls against blanket purchase agreements. DFARS 208.405-2 (S-70) states that oral orders not in excess of small purchase thresholds are authorized for orders from multiple-award schedules. Oral orders issued against indefinite delivery contracts must be confirmed in writing although written confirmation may be a letter and not a contractual document. [FAR 16.506 (b)].

As a general rule, Government acquisition regulations require written contracts to be signed. FAR 1.601 states "Contracts may be entered into and signed on behalf of the Government only by contracting officers." Of course, that rule refers to those transactions not falling within the exceptions specified above.

FAR 4.101 states the following:

Contracting officer's signature: (a) Only contracting officers shall sign contracts on behalf of the United States. The contracting officer's name shall be typed, stamped, or printed on the contract. The contracting officer normally signs after it has been signed by the contractor. The contracting officer shall ensure that the signer(s) have authority to bind the contracts.

Modern technology makes possible in EDI transactions electronic message authentication to ensure the transaction is executed by someone having authority. The question of "a writing" and "signature" when viewed against 31 USC§1501, FAR 2.101, and 4.101 is ambiguous with respect to EDI. Certainly, the desire of Courts and Boards to uphold the intent of the parties will prevail. If the intent of the parties is to form a binding agreement and the computer equipment and techniques are reliable, the agreement should be legally binding.

With respect to electronic signatures for the statutory requirement of certifying public vouchers under 31 USC§3325 and §3528, the law is clearer and further developed. The General Accounting Office (GAO) has stated the following:

The essence of certification is the assurance or representation that some act has or has not been done, or some event occurred, or some legal formality has been complied with.

In Memorandum B-104590, September 12, 1951, the Comptroller General stated the following:

While certifications of the nature here involved ordinarily are accomplished by handwritten signatures, the obvious burden that would result by requiring same affords a basis for the adoption of an alternate means, if otherwise proper. In this regard, the courts have held that a signature consists of the writing of one's name and of the intention that it authenticate the instrument, and, therefore, any symbol adopted as one's signature when affixed with his knowledge and consent is a binding and legal signature when the statute requires an instrument to be signed. Citing 13 Comp. Dec. 749; 1 Op. Atty. Gen. 670.

Of course, the GAO has long recognized facsimile signatures and machine-made signatures as legally binding. The GAO concluded in Memorandum B-216035, September 20, 1984, that

an appropriate symbol may be adopted by a certifying officer as his signature for the purpose of voucher certification. The signature serves as a guarantee of the authenticity of the certificate. See also *Black's Law Dictionary*.

Today, EDI transactions can include an electronic message authentication code that ensures the certification was made by someone with the requisite authority to certify.

In any event, Courts uniformly hold that with respect to signatures, the operative condition is the "intent" to use a marking as one's signature rather than the marking itself. It must be shown that the maker of the symbolic signature intends to be legally bound. The prevailing legal view today respecting electronic signatures sets forth at least two requirements before gaining legal efficacy: (1) electronic signatures must be adopted as a person's "unique code signature" and (2) appropriate security measures must exist to ensure that the "code" cannot be accessed by unauthorized individuals. This latter requirement must not be minimized.

The General Services Administration (GSA) had little difficulty in accommodating EDI in transportation activities by regulatory change. In amending 41 Code of Federal Regulations (CFR), Part 101-41, the GSA, without resorting to a statutory change, clarified the "writing" and "signature" requirements regarding bills of lading, audit, and payment. The GSA regulations state:

Electronic Data Interchange, (EDI) means the electronic transmission of the information in lieu of the creation of a paper document. Also, 'signature' in the case of EDI transmission, means a discrete authenticating code intended to bind parties to the terms and conditions of a contract.

[Author's Note: While this guide was in printing, GAO issued a memorandum opinion that should advance the development of EDI, and to a greater extent, clarify the question of whether EDI documents satisfy the requirements of 31 USC§1501. The

following is some significant language taken from GAO Memorandum B-238449, Electronic Contracting, 19 June 1991.

EDI is the electronic exchange of business information between parties, usually via a computer, using an agreed upon format. EDI is being used to transmit shipping notices, invoices, bid requests, bid quotes and other messages. Electronic contracting is the use of EDI technologies to create contractual obligations. EDI allows the parties to examine the contract, usually on video monitors, but sometimes on paper facsimiles, store it electronically (for example on magnetic tapes, on discs or in special memory chips), and recall it from storage to review it on video monitors, reproduce it on paper or even mail it via electronic means. Using EDI technologies, it is possible for an agency to contract in a fraction of the time that it now takes. The "paperless" nature of the technology, however, has raised the question of whether electronic contracts constitute obligations which may be recorded against the government.

To constitute a valid obligation under section 1501 (a)(1)(A), a contract must be supported by documentary evidence "in writing." Some have questioned whether EDI, because of the paperless nature of the technology, fulfills this requirement. We conclude that it does.

For the purpose of interpreting federal statutes, "writing" is defined to include "printing and typewriting and reproductions of visual symbols by photographing, multigraphing, mimeographing, manifolding, or otherwise." 1 U.S.C. § 1 (emphasis added). Although the terms of contracts formed using EDI are stored in a different manner than those of paper and ink contracts, they ultimately take the form of visual symbols. We believe that it is sensible to interpret federal law in a manner to accommodate technological advancements unless the law by its own terms expressly precludes such an interpretation, or sound policy reasons exist to do otherwise. It is evident that EDI technology had not been conceived nor, probably, was even anticipated at the time section 1501 and the statutory definition of "writing" (sic) were enacted. Nevertheless, we believe that, given the legislative history of section 1501 and the expansive definition of writing, section 1501 and 1 U.S.C. § 1 encompass EDI technology.

Department of Defense personnel who are engaged in implementing EDI in any program should study the GAO opinion thoroughly.]

3.3 RECORD KEEPING AND EVIDENTIARY MATTERS

Record keeping regulations and the Federal Rules of Evidence have a far better track record in keeping pace with computer technology than have the contract formation regulations. For instance, the Federal Rules of Evidence are used in Courts and Boards involving Federal questions including DoD contract disputes. The Federal

Rules take a modernistic approach to what evidence may be admitted into evidence in litigation. They should not be viewed, therefore, as obstacles to using EDI in DoD transactions.

The requirement for record keeping is clear and must comply with Chapter 31, Title 44 of the United States Code, *Records Management by Federal Agencies*. It requires Federal agencies to "establish and maintain an active, continuing program for the economical and efficient management of the records of the agency," and "provide for effective controls over the creation and maintenance of records in the conduct of current agency business" (44 USC§3102).

At 44 USC§3301, Federal records are said to include all

books, papers, maps, photographs, *machine-readable materials* or other documentary materials, *regardless of physical form or characteristics*, made or received by an agency of the U.S. Government" (emphasis supplied).

That language would seem to accommodate and encourage the use of modern information technology, including machine-readable EDI documents.

The Federal Rules of Evidence are even more accommodating. Rule 1001(1) states in part:

Writings and Recordings ... consist of letters, words, or numbers, or their equivalent, set down by "... magnetic impulse, mechanical or electronic recording or other *data*" compilation (emphasis supplied).

In adopting EDI, DoD will necessarily have to maintain a host of files, which are nothing more than electronically imprinted codes on magnetized surfaces. These are really electronic or magnetic filing systems. DoD records maintenance personnel should not, therefore, be overly concerned with substituting EDI documents for hard copy since it is obvious that these electronic files are considered "writing or recordings" under the law. The rules of evidence are no different for electronically filed records than for paper records.

Furthermore, in the final analysis, any regimen in record keeping should be built with a view toward what a Court will accept as evidence should a dispute or controversy arise. Judges use the "best evidence rule" when admitting documents into evidence, which means they want the original document. In this regard Federal Rule of Evidence 1001(3) states in part:

An "original" of a writing or recording is the writing or recording itself or any counterpart intended to have the same effect by a person executing it If data are stored in a computer or similar device, any printout or other output readable by sight, shown to reflect the data accurately, is an "original."

Title 28 USC§1731 provides for the admissibility of copies or reproductions of original records kept in the regular course of business. These evidentiary rules should give comfort to DoD personnel desiring to implement EDI transactions. There are many more accommodating rules. This guidance is not intended as an exhaustive treatment. Legal advice is critical throughout the design and implementation of any EDI system.

Recently, the FAR was amended to clarify the issue of electronic records (Federal Acquisition Circular 84-53), for DoD contractors and trading partners.

- (d) If the information described in paragraph (a) of this section is maintained on a computer, contractors shall retain the computer data on a reliable medium for the time periods prescribed. Contractors may transfer computer data in machine readable form from one reliable computer medium to another. Contractors' computer data retention and transfer procedures shall maintain the integrity, reliability, and security of the original computer data. Contractors shall also retain an audit trail describing the data transfer. For the record retention time periods prescribed, contractors shall not destroy, discard, delete, or write over such computer data.

In May 1990, the National Archives and Records Administration (NARA) issued final regulations on Electronic Records Management. Following is an extract:

§1234.24 Judicial use of electronic records.

Electronic records may be admitted in evidence to Federal courts for use in court proceedings [Federal Rules of Evidence 803(8)] if trustworthiness is established by thoroughly documenting the recordkeeping system's operation and the controls imposed upon it. Agencies should implement the following procedures to enhance the legal admissibility of electronic records.

- (a) Document that similar kinds of records generated and stored electronically are created by the same processes each time and have a standardized retrieval approach.
- (b) Substantiate that security procedures prevent unauthorized addition, modification or deletion of a record and ensure system protection against such problems as power interruptions.
- (c) Identify the electronic media on which records are stored throughout their life cycle, the maximum time span that records remain on each storage medium, and the NARA-approved disposition of all records.
- (d) Coordinate all of the above with legal counsel and senior IRM and records management staff.

3.4 FREEDOM OF INFORMATION ACT

The Department of Defense implements the Freedom of Information Act (FOIA) at 32 CFR 286. In a recent amendment, the

regulations contain, for the first time, guidance relative to the release to the public of electronic data under the Act (55 Fed. Reg. 53104, 26 December 1990).

The DoD policy is to conduct its activities openly and provide the public with a maximum amount of accurate and timely information on its activities, consistent always with national security and the legitimate interest of the American people. A DoD record requested by a member of the public who follows rules established by proper DoD authority can be withheld only when it is exempt from mandatory public disclosure under the FOIA.

An agency record is defined as

... the products of data compilation, such as all books, papers, maps, and photographs, machine readable materials or other documentary materials, regardless of physical form or characteristics, made or received by an agency ... in connection with the transaction of public business and in DoD's possession and control at the time the FOIA request is made.

When reaching a decision on whether to release information to the public, DoD officials must distinguish between whether the requested information is a record (under the law) or is other valuable property. This distinction is especially important when the request might entail intellectual property.

Administrative tools that are used to create, store, and retrieve records are not normally considered records. Included among those tools are items such as computer software, source code, object code, listings of source and object code, etc. However, they do not include the underlying data that are processed and produced by the software. In some instances, such data may be actually stored with the software.

Sometimes computer software may, by necessity, be treated as an agency record and processed under the FOIA procedures. This should occur rather infrequently; it may occur in a situation in which the data are embedded within the software and cannot be extracted without the software. In other instances, the software may reveal information about the policies, procedures, or decisions of DoD; an example is a computer model that forecasts budgetary outlays. In those instances, the requests must be considered on a case-by-case basis. The record custodian will invariably need the assistance of both legal counsel and the information specialist before making a decision to release or withhold this information from the public.

Some information stored within a computer has no computer program to retrieve it; in that case, the custodian is not required to develop a program to fulfill the request.

The record custodian must also be sensitive to a request for electronically stored data that would reveal "company-confidential"

information of a contractor — especially to a competitor. That sensitivity is especially necessary with the reinstatement of the Procurement Integrity Act. In every instance in which doubt exists, the custodian must seek legal advice before releasing the information.

3.5 MATERIAL INSPECTION AND RECEIVING REPORT (DD FORM 250)

If the Department of Defense is to benefit completely from the full potential of employing electronic commerce in procurement, all related activities must be rationalized into a unified system. The inspection and receiving function is an important player in the system.

The historic problems with administering the DD Form 250 should not be minimized. Its importance to any successful acquisition is critical, and it forms the basis of much litigation. The legal problems associated with inspection and acceptance will not be eliminated by automating the DD Form 250 function. However, the ability of electronic commerce to make available crucial information in real time to the appropriate parties should result in eliminating most delays and misunderstandings that tend to spawn litigation.

The inspection and receiving function does not contain the statutory regimen that we have in contract formation and funds transfer. Therefore, most restrictions are regulatory and can readily be modified, where necessary, to accommodate automating this function.

Historically, the signature plays an important role in the DD Form 250 process since it provides a hard-copy, manual signature that is very difficult to disavow at a later date should the authenticating official change his or her mind about the goods or services being in conformity with the contract requirement. In the event of a contract dispute, electronic commerce and the proposed DD Form 250 transaction set can provide completely the kind of evidence of inspection that the hard-copy manual signature provides. The critical process is to maintain a record or audit trail so that proof may be recaptured for presentation in a Court or Board of Contract Appeals.

What is necessary is a record of

- When acceptance occurred
- When goods were shipped
- When goods/services were received
- Whether the goods/services conformed, and if not, whether the discrepancies were annotated
- Traceability.

EDI transaction sets can meet these rather fundamental requirements with little or no disagreement. Further, real-time information to the appropriate parties is automatic.

An EDI-based system should permit the Quality Assurance Report (QAR) to "sign-off" and distribute the information at the same time rather than having the contractor distribute the information after the QAR "sign-off." This should give the Government a better measure of control as well as speed distribution, reduce errors, and minimize misunderstandings.

We see no reason for a manual hard-copy signature for the Material Inspection and Receiving Report. Of course, the appropriate levels of security and authentication, as discussed above, should be met. Very rarely, if ever, should the need arise for encryption in automating this function.

3.6 TRADING PARTNER AGREEMENTS

Sometimes referred to as "preauthorization agreements," TPAs should be drafted and executed with substantive help from legal counsel. A carefully drafted TPA can be crucial in complying with the requirement of a writing in 31 USC§1501 especially when contracting for large purchases. Whether it is a stand-alone agreement or simply a provision in a master agreement, the TPA should be executed before beginning trading with EDI transaction sets.

With respect to the trading partners, the TPA is a key document setting forth the rights and obligations of the parties. It is executed in hard copy while tailoring the provisions to suit the norms of the industry, whether transportation, medical supplies, grocery, etc. The following elements are essential components of any TPA.

- *Recital* - A statement that the parties desire to enter a mutually binding agreement to begin exchanging EDI transaction sets. The recital should state that the parties intend to be legally bound in the same manner as though they were exchanging hard-copy paper documents.
- *Standards* - DoD has adopted the ANSI X12 standards developed by the ASC X12. The TPA should specify all standards and their issuing organizations; it should include data dictionaries, segment dictionaries, etc.; and it should state how to handle updates of newly adopted standards.
- *Documents* - The TPA should specify which transaction sets are to be exchanged between the parties. The TPA is a good place to incorporate by reference the industry guidelines that will be followed. ANSI ASC X12 has developed numerous transaction sets in the 800 series. Many DoD procurement, financial, and shipping documents can be transmitted using the general EDI transaction, segments, and data

element framework. Other times, the transaction sets will necessarily require modifications peculiar to DoD.

- *Duration* - The TPA should specify the signatory requirements and any necessary approvals as well as the effective date and period the TPA is to be in effect.
- *Mode of EDI* - DoD may require the use of the DoD system, or FTS-2000. If approval is obtained to use an independent provider, the TPA should specify the name of the provider, the payment for services, and the notification or procedure required to change the provider.
- *Acknowledgments/Acceptance* - The TPA should include the requirement for any special acknowledgment or acceptance as a condition to the transaction having legal effect. If you wish remittance advice, for example, specify it here.
- *Disputes* - DoD contracts must contain the standard disputes clause as specified in FAR 52.233. (Do not agree to follow state law or arbitration procedure as many trading partners wish to do.)
- *References* - You may incorporate any special publications, specifications, and guidelines by reference, and you should specify the order of priority in case of internal conflict.
- *Security* - You should agree upon security procedures to be followed by each party to protect business data from improper access and/or disclosure and you should specify those procedures.
- *Signatures* - The TPA should establish some method such as a discrete authentication code that can be affixed in code or symbol to each transaction set to provide for authentication and the confidentiality of the signature of the respective parties.
- *Mailbox Contents* - The TPA should specify when and what time the parties are required to review and collect the contents of their mailboxes. Other similar ordering or shipping requirements may be further specified.
- *Force Majeure* - The TPA should include a typical Act of God clause excepting such things as explosion, fire, or flood from imposing liability on either party.
- *Garbled/Erroneous Transmissions* - The TPA should allocate the risks of garbled or erroneous transmission as negotiated. It should specify who shall be liable, if anyone, and to what extent, for these maltransmissions. If a third-party provider is responsible, what is the extent of its liability?

- *Termination* - If the agreement may be terminated by either party, the TPA should state so. It should also specify the termination notification period. It should set the parameters and termination procedures to be followed if one of the parties falls below the acceptable standard of performance.
- *Damages* - The TPA should describe how the parties should handle special or consequential damages as well as actual or liquidated damages.
- *Whole Agreement* - The TPA should contain the typical whole agreement clause invoking the parol evidence rule.
- *Special Terms and Conditions* - You may add any other special provisions that may be wise and necessary to the efficient trading operation.

The Electronic Messaging Services Task Force, a Subcommittee on Electronic Commercial Practices, Uniform Commercial Code Committee, Section of Business Law, American Bar Association has prepared a draft model agreement to assist the practitioner in preparing TPAs. It should be used only as an aid in conjunction with advice from your agency legal counsel.

3.7 THIRD-PARTY SERVICE PROVIDER AGREEMENTS

The DoD policy requires that its agencies use the Defense Switched Network (DSN) or the Defense Data Network (DDN) or FTS 2000 as the transmission system of first choice for all new acquisition requirements. The commercial sector, however, offers transmission services with a host of value-added services.

If you decide to use a commercial third-party or VAN, you have many choices and the market is growing more competitive. Third-party providers can be of great service in getting any EDI program off to a good, sound, solid start. They can provide a variety of services especially in getting many small unsophisticated trading partners conversant with the technology, can assist in selecting hardware, and software and in providing training.

Usually the third-party service providers have their own printed contract forms; however, since competition is growing among these companies, you should have a good deal of leverage in negotiating acceptable terms and conditions.

As with any legal agreement, the third-party service provider agreement should not be drafted and executed without the assistance of competent legal advice. Many of the terms and conditions discussed above under TPAs will be used in the third-party agreement. For example, the merger or whole agreement clause is a necessity as well as the force majeure clause, which exonerates the provider from liability connected with acts of God, such as fire, flood and a variety of causes outside the control

of the service provider. In addition, you should negotiate acceptable terms on the following:

- A complete description of the services to be provided to the respective trading partners.
- The language specifying that the third-party provider has no independent property interest in the data and further, foreclosing any claim that the provider has added value to the data giving some legal right to a mechanics lien or a possessory lien.
- An understanding that the provider will store records or perform some archival service should be covered along with the associated cost. If you desire back-up copies, this agreement should provide for them. It should also provide for how long back-up copies will be kept.
- The confidentiality, integrity, and security measures to be provided need to be memorialized in the agreement. For example, "will the signature authentication code be encrypted?"
- The third-party provider's responsibility for accurate, reliable service. You should also designate the third-party's liability. What is the measure of the provider's liability? Will it be responsible for compensatory damages in case of data loss, delay, mistakes, or misdirection? How about liquidated damages? It is not customary to expect exemplary or punitive damages; nevertheless, this should be spelled out in the agreement.
- When the agreement will terminate, whether it can be changed periodically, and whether the parties are free to change service providers after one has been agreed upon. This is the time and place to so specify. Agree upon a standard of service below which the parties may terminate the agreement without risk of breach and associated damages.
- Very definite language detailing exactly how network charges, if any, are to be shared between the suppliers and the customers. Perhaps DoD may be able to negotiate a no-cost service provider agreement with the network. There are instances today where this is so, even though EDI has not burgeoned yet, and it will get even more competitive.
- A warranty that the provider's system, when used in consonance with procedures specified, will perform as stated. This should not mean the provider has absolute liability but that the provider should deliver services as promised barring extraordinary circumstances. Inclusion of provision that this warranty is in lieu of any warranties implied by law is a reasonable requirement.

- The network requirements to support ANSI or Electronic Data Interchange for Administration, Commerce, and Transport (EDIFACT) standards. Your expectations should be specified. What audit trails are expected?
- All record keeping requirements. You should specify all such requirements. For example, when can the provider discard the data? If the provider wishes a short statute of limitations beyond which its liability is forgiven, that may be beyond a Government negotiator's power to agree to; use the statutory period provided by Federal law.

4.0 SYSTEM ARCHITECTURE AND ENVIRONMENT

This chapter describes the system architecture that DoD uses for electronic commerce (EC). The chapter begins with a description of the DoD Standard System architecture, including the intelligent gateway, Computer-Aided Acquisition and Logistic Support (CALS), integration, trusted systems/computer security integration, an integrated network strategy, the EDI VAN integration, and the procurement bulletin board integrations. It then presents a brief description of the system architectures used in private industry, a discussion of application integration, and the generic functions performed by translation software.

4.1 SYSTEM ARCHITECTURE OF THE DoD STANDARD SYSTEM

The system architecture of a DoD EC/EDI implementation involves complex systems integration of a number of crucial components. The end result is horizontal integration of applications within DoD, a single face to private industry, and greatly enhanced efficiency and effectiveness of DoD applications. Figure 4.1-1 shows some of the components in the engineering approach that need to be integrated into the DoD standard system.

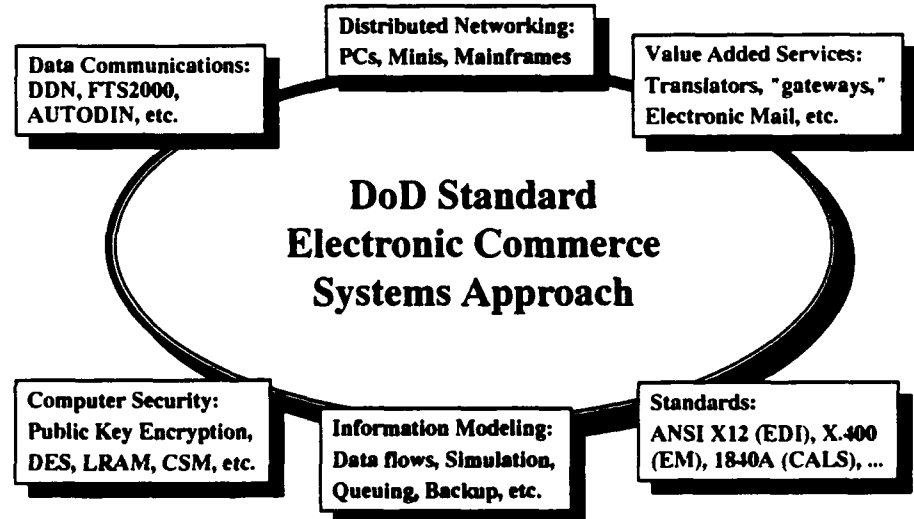


Figure 4.1-1 Engineering Approach: Complex Systems Integration

4.1.1 Overview

The underlying architecture for the DoD standard system calls for the integration of all existing Service and agency systems through the use of a series of Intelligent Gateway Processors

(IGPs) that will serve either as external minicomputers or as resident software on one of the existing computer systems. The combination of IGPs and existing computer systems will hasten the use of EC/EDI techniques without the replacing or reprogramming existing computer systems and will make the following benefits available:

- Trusted systems integration into electronic mail and data base transfers
- CALS integration
- Computer bulletin board integration, especially for such activities as procurements
- The creation of a virtual system of systems, with everything connected to everything.

The following illustrations show the difference between the "standard" EDI approach, and the DoD standard EC through EDI approach. In Figure 4.1.1-1, note the bold box around the EDI translator; in most systems this is the beginning and the end of an integrated approach, leaving it to the individual user to deal with networks, telecommunications, and applications interfaces. Figure 4.1.1-2 shows the role that the EC systems approach can play, integrating end-to-end.

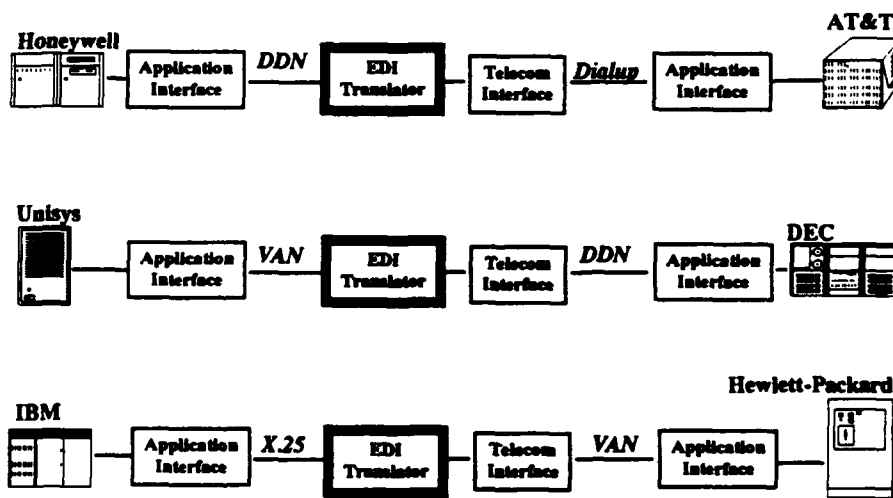


Figure 4.1.1-1 Electronic Data Interchange: Only Part of the Story

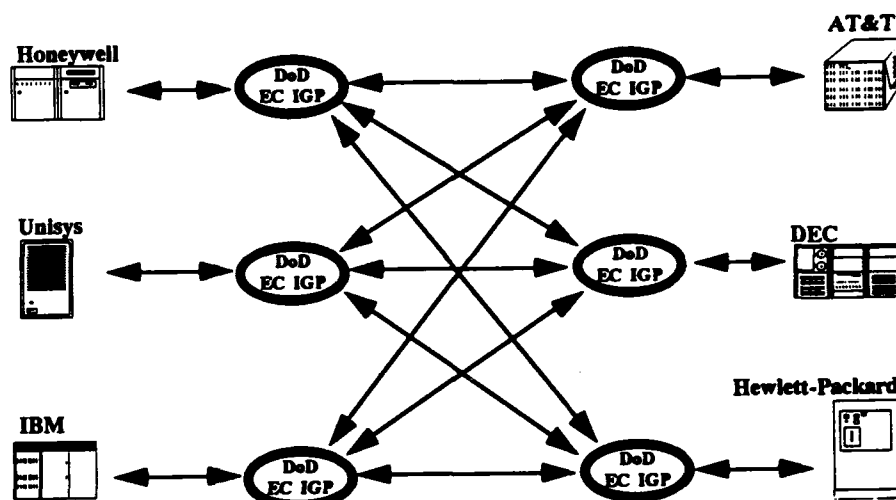


Figure 4.1.1-2 Electronic Commerce via the IGP:
The Rest of the Story

4.1.2 The Lawrence Livermore National Laboratory Intelligent Gateway

One of the key components in the EC systems approach is the LLNL intelligent gateway processor. The IGP is a combination of hardware and software designed for transparent, "intelligent" connectivity to heterogeneous computers. Originally designed at LLNL almost a decade ago, it was based on pioneering work done at the National Bureau of Standards [now the National Institute of Standards and Technology (NIST)]. The original design has undergone many revisions and improvements over the years, and the basic requirements are currently as follows:

- **Hardware** - Any standard UNIX platform, including both AT&T UNIX and OSF UNIX. This hardware includes even 80386- based personal computers (PCs) running UNIX.

The initial recommendation for a pilot platform is the AT&T 3B2/600G. That computer was chosen because of its robustness, inexpensive price, and ready availability on Government contract.

- **Software** - The IGP software, originally developed at LLNL and currently in use by over 20,000 DoD users worldwide.

In a technology-transfer agreement, the IGP software has been licensed to Control Data Corporation (CDC), and both software and services are available under the ASCENT product line. The agreement ensures that the operational implementation of the IGP is commercially supported and maintained.

The following three illustrations show the state of affairs without the IGP, the result of adding a traditional gateway, and finally the functionality provided by the full functional integration that the IGP offers.

Figure 4.1.2-1 shows there are still organizations that require a separate terminal for access to each different type of mainframe computer.

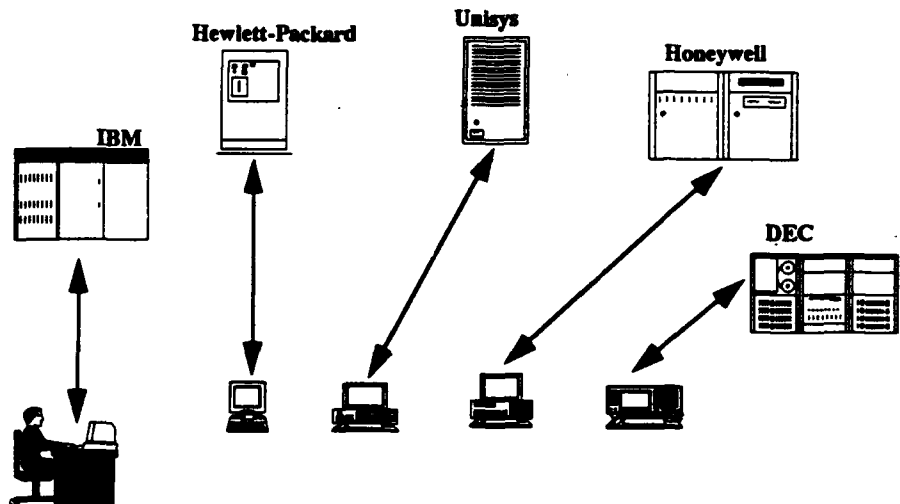


Figure 4.1.2-1 Without the IGP: Computers, Multiple Terminals

The situation shown in Figure 4.1.2-2 is the result of employing what is today described as gateway technology. However, almost all gateways available only bring one to the doorway of another computer system, leaving the user to deal with that computer's applications programs. In addition, most current "gateways" rely on a limited range of connectivity options (usually Ethernet).

The value added by the *intelligent* gateway processor is that it mediates more than the physical connection between machines: it goes into the other systems and extracts the needed data for the user without the user's needing to know how to use that computer or that computer's application programs. In addition, the IGP is designed to transparently link various types of telecommunications options with a single machine. Figure 4.1.2-3 shows how this will appear.

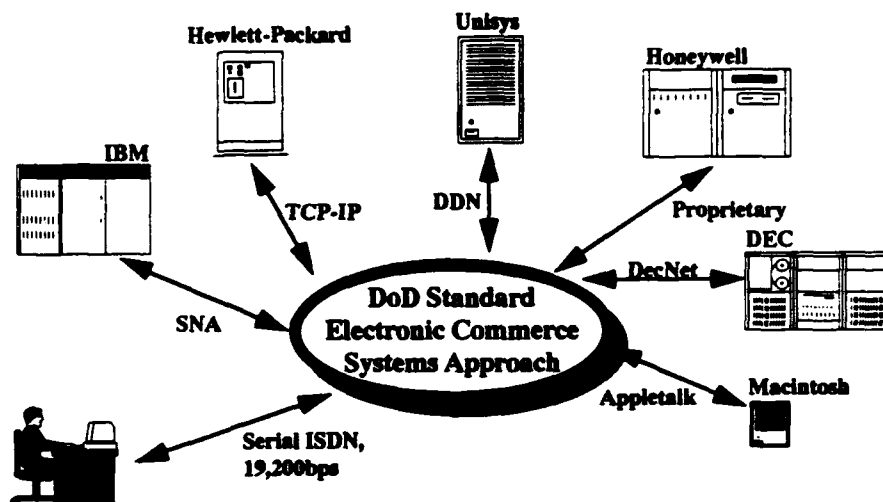


Figure 4.1.2-2 With A Gateway: A Single Access Point to Multiple Resources

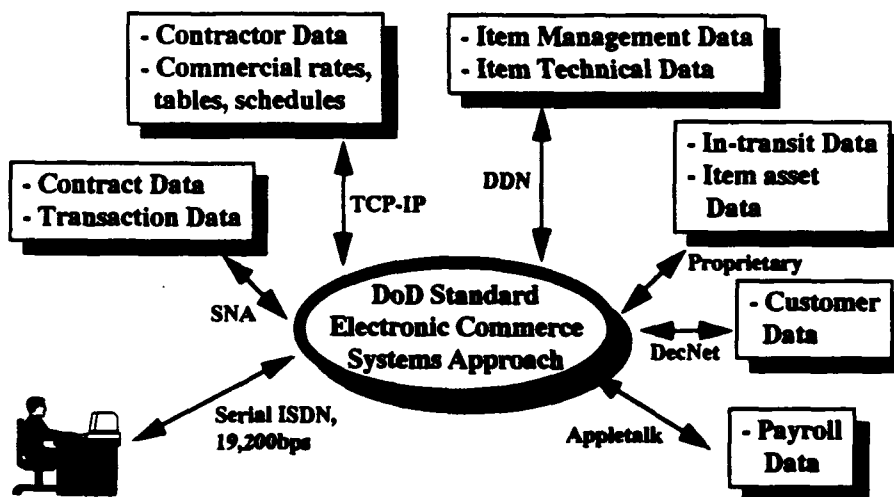


Figure 4.1.2-3 With the IGP: A Single Access Point to Data of All Types

4.1.3 CALS Integration

For years CALS has been a joint DoD-industry program to provide standardized ways of exchanging engineering drawings and technical data. Until recently, however, the telecommunications aspects had not been dealt with in the CALS program. Fortunately, DoD recently saw the synergy between the EC/EDI initiative and CALS, and has determined that the two programs

are complementary, pursuing common technical solutions for interchanging CALS and EC/EDI information. DoD has publicly stated that it is committed to the use of EDI transactions in CALS, and vice-versa whenever appropriate. As a part of that commitment, CALS work and EC/EDI work are now coordinated in the same organization in the Office of the Secretary of Defense. In addition, DoD is committed to working with the CALS Industry Steering Group on further integration strategies.

Figure 4.1.3-1 shows the range of activities which will be included in a strategy integrating both CALS and EC/EDI techniques.

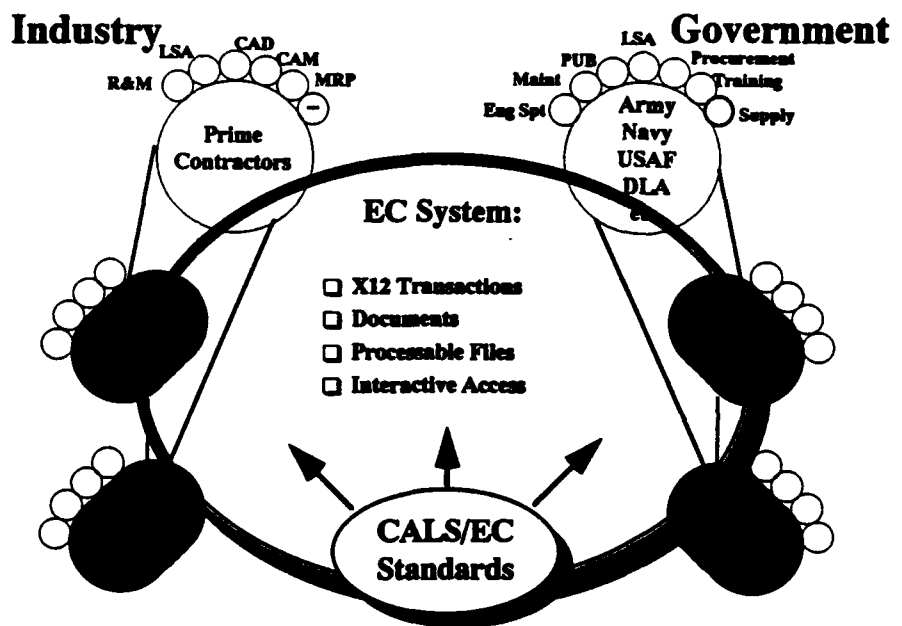


Figure 4.1.3-1 EC/CALS Environment, 1995

Figure 4.1.3-2 shows some of the functional areas in which CALS applications can take advantage of EC/EDI techniques.

4.1.4 Trusted Systems/Computer Security Integration

Another crucial part of the DoD implementation plan is the inclusion of "trusted systems" technology in the entire design, from the operating systems to the individual messages passed. Trusted systems are sometimes called protected or encrypted systems, and their basic distinguishing factor is that they provide the capability of knowing for certain that a message received was in fact sent by the person or organization who purports to have sent it and that message has not been changed by a third party. In addition, trusted systems enable the sender to provide the capability of encrypting a message or transaction so that it cannot be read by anyone but the intended recipient.

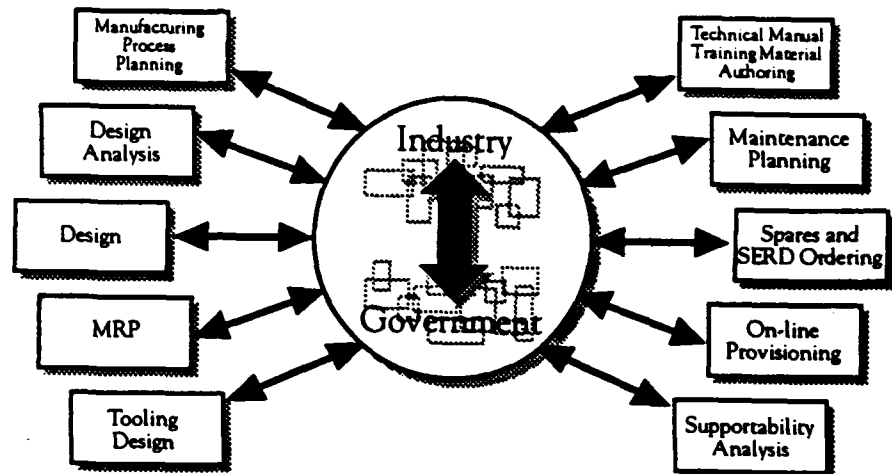


Figure 4.1.3-2 EC/CALS Functional Integration Target

4.1.4.1 Trusted Operating Systems

With the threat and reality of "cracker/hacker" computer break-ins, it is increasingly important to be able to deal with potential outsiders attempting to enter a computer system. For this reason trusted operating systems are being designed and tested. The EC/EDI system described here will review the results of testing by the NIST and the National Security Agency to determine the best operating systems to be utilized for the implementation of the EC/EDI program. Initial indications are that leading contenders in this area are AT&T multilevel secure (MLS) UNIX and Trusted Information Systems (TIS) Trusted XENIX/MACH. In any case, the DoD EC/EDI Standard System will comply fully with any standards issued by NIST.

4.1.4.2 Protection of Message and Transaction Traffic

A combination of computer security techniques will be used to protect message and transaction traffic. That combination will include the best of the DES with Public Key Cryptography (PKC) to provide the capability to do the following:

- Electronically sign any type of digital file or document
- Electronically seal (fully encrypt) a digital file or document, or any portion of that file or document
- Provide electronic protection of vendor proprietary data [e.g., bids responding to an request for quotations (RFQ) or request for proposals (RFP), etc.]

- Provide appropriate levels of end-to-end data protection and privacy for all types of DoD logistics- and business-related transactions and documents.

In addition, the implementation either utilizes strictly commercial off-the-shelf components, or will work to commercialize any appropriate component, so that private industry can take advantage of and be compatible with the DoD Standard System.

The following standard systems and commercial products are among those being considered for inclusion:

- LLNL trusted mail (TM)
- DARPA/TIS privacy enhanced mail (PEM)
- RSA toolkit for internet PEM (TIPEM)
- NIST data encryption standard (DES)
- Internet Activities Board (IAB)
- Bell Northern Research (BNR) packet data security overlay (PDSO)
- Livermore risk assessment methodology (LRAM)
- Livermore computer security monitor (CSM)
- Plus the security aspects of X12, X.400, and other standards.

4.1.5 Integrated Network Strategy

The EC/EDI approach to networks is to provide an integration of three overall systems: the Electronic Commerce Test Network (ECTN), the EC Operational Pilot Network (OPN), and finally the EC Operational Network (ECON).

The ECTN primarily serves as a testbed for developing new capabilities and for testing new integration strategies. Its specific purposes are the following:

- Establish network interoperability with commercial VANs, linking them with DoD systems
- Establish network interoperability with the entire range of potential DoD systems, regardless of the network host on which they reside
- Design and test complex integrated software for enhancing connectivity to the wide range of heterogeneous computers and applications described above
- Test and evaluate both software-based and hardware-based data protection and security systems

- Test and evaluate commercial EDI translation and mapping software.

The EC Operational Pilot Network is to serve as a release point for tested solutions for use in an operational environment. OPN users are doing real work with the technology that has been tested in the EC test network. As solutions are tested and validated in the ECTN, they are migrated in an orderly fashion into the OPN. An example of this is the logistics information network (LINK) portion of the EC/EDI project, which provided connectivity between logistics data bases around the world and the troops in the field in *Operation Desert Storm*. In addition, the OPN will provide real-world identification of needs that the commercial sector has yet to meet, which will in turn feed back into the ECTN for appropriate development.

The EC Operational Network is the umbrella under which all activities work. Just as solutions are validated in the ECTN and migrated to the OPN, the same process applies to the ECON. As solutions are validated in the OPN, they will be endorsed for DoD-wide use in the ECON.

A crucial point in viewing this process is that the entire system is designed to do useful work for someone from the very beginning. The DoD approach is *not* to engineer a proof of principle, but rather to do real work and to satisfy real needs. The EC/EDI system is a transitional system, not a turnkey system. It answered real needs in the *Operation Desert Shield/Desert Storm* arena, and will continue to answer real needs in relief efforts in other arenas in the days to come.

Figure 4.1.5-1 shows a graphic view of the interrelationship of the three networks.

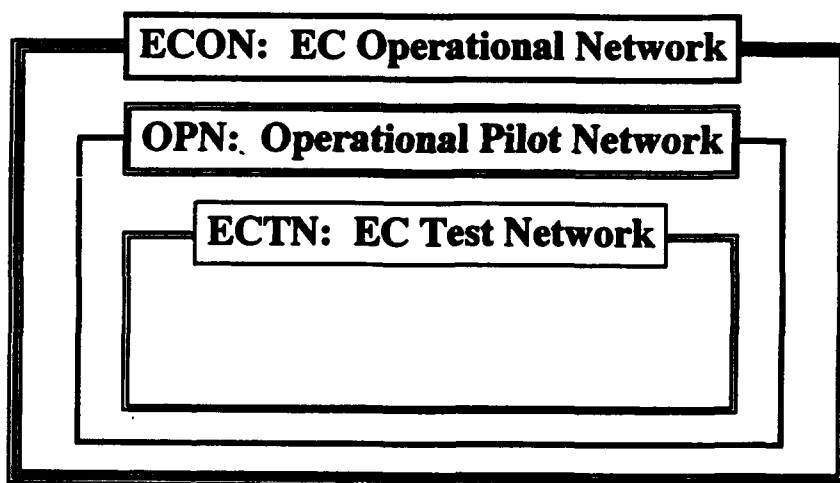


Figure 4.1.5-1 Electronic Commerce Network Overview

Figure 4.1.5-2 shows some of the functional areas in which support has already been demonstrated for the early implementation of the EC/EDI standard systems approach and once again shows the relationship of the ECTN and OPN to the ECON.

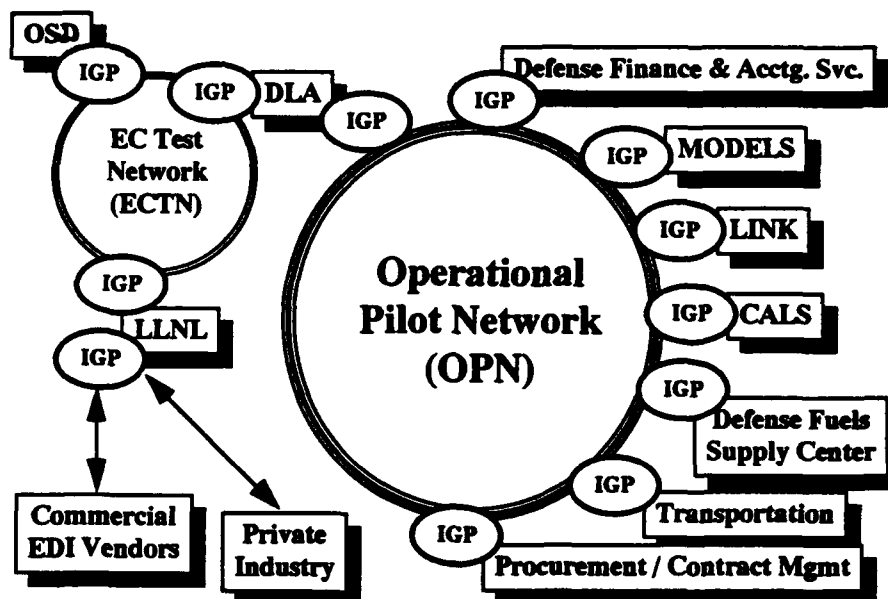


Figure 4.1.5-2 Relationship of ECTN and OPN to ECON

4.1.6 EDI VAN Integration

The DoD currently does business with hundreds of thousands of companies, large and small, many of whom are already using EDI techniques. However, the VANs those businesses are using comprise the complete range of VANs available. In order for DoD to most efficiently utilize the capabilities of the industry, it needs to adapt the techniques used by private industry, which are traditionally very vertically integrated, into a DoD-wide horizontal integration strategy. This will permit any DoD user to deal with any private industry user, regardless of the VAN used by that private-industry user. An illustration of how this might work appears below, following a description of the procurement bulletin board integration strategy.

4.1.7 Procurement Bulletin Board Integration

One of the more costly aspects of procurement in DoD and in fact throughout the Federal Government is small procurement. The administrative cost of making a single purchase of an item under \$25,000 can be anywhere from \$50 to \$250 or more. EC/EDI techniques, utilizing a

computer bulletin board look and feel, have the potential to solve that problem and still meet the following requirements:

- Timely posting of new RFQs
- Even competition, in accordance with FAR 13.105
- Lower cost than current paper-based and telephone-based systems
- Maintenance of integrity and confidentiality of bids submitted
- Provision of award information in a trusted fashion to all bidders, as appropriate
- Integration with major information systems already in place, such as the Base Contracting Automated System (BCAS), used throughout the Air Force, Marine Corps, Navy, and some Army bases
- Integration with standard X12 EDI transactions
- Integration with two-way electronic mail between suppliers and DoD.

The EC/EDI integration plan includes electronic mail as the carrier of information, utilizing trusted system techniques to ensure confidentiality of bids. The series of events would follow a sequence similar to the following:

- DoD contracting and procurement offices provide RFQs by electronic mail to a DoD computer host.
- The DoD computer host, utilizing intelligent gateway techniques, disseminates that information to all participating commercial VANs, utilizing whatever telecommunication channels and techniques are necessary.
- The VANs, on receipt of the information, make it available to their private-industry suppliers/subscribers for standard fees.
- Private-industry subscribers utilize the postings on the VANs in whatever method the VAN provides as long as they are able to make a bid or other response through electronic mail.
- The VANs receive electronic mail bids and responses from private-industry subscribers and forward them directly to the DoD host.

- The DoD host computer receives a bid or other response from the VAN connection; that communication is time-stamped and archived for audit-trail purposes, and is simultaneously forwarded to the original contracting officer.
- After the appropriate period has passed, a contract award is made, and that information is sent out via the same channels to the awardee and posted on the bulletin board of each VAN as a contract awarded.
- At this point, the EDI transactions that were a part of this entire process interface with the rest of the purchasing process, finally culminating in the payment of an invoice (which was also received electronically).

A number of unique features in this system should be pointed out, most of which would be impossible with a single, third-party VAN. Among them:

- As appropriate, trusted mail components will be utilized at both ends of the spectrum, i.e., the individual supplier and the DoD contracting officer.
- Private-industry suppliers may choose the VAN that provides the best price/performance combination, thus encouraging competition among the VANs. In addition, suppliers in private industry already using one VAN will not be required to switch, thus avoiding the expense of changeover.
- The DoD host computer will have full audit-trail capabilities, with archiving being done to optical disk media [such as write-once, read-many (WORM) drives].
- The DoD contracting officers and others involved in the procurement cycle will have complete control over their data and the uses to which those data are put, without being hostage to a third-party contractor.
- The requirement that private industry approach DoD through commercial VANs avoids the necessity of having DoD maintain vendor accounts on Government computers.
- Basing the system on electronic mail and query by mail techniques avoids the requirement for having thousands of simultaneous log-ins on any individual computer, either DoD's or a commercial VAN's.
- The hosting of information on a DoD computer allows for powerful statistical analysis of data, including cross-VAN comparisons of VAN performance.

- The hosting of information on a DoD computer improves the preparation phase, including the automatic scanning of debarred lists, local "tweaking" to provide for minority or local suppliers, etc.

Figure 4.1.7-1 shows the DoD strategy for integration of the commercial VANs with the DoD ECON, to provide Government buyers and commercial suppliers with broad-based connectivity.

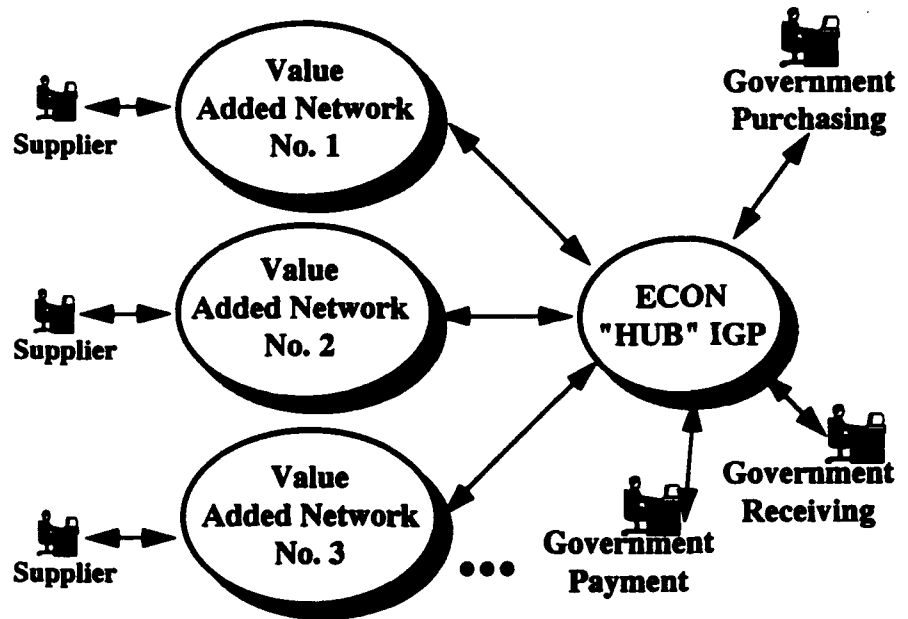


Figure 4.1.7-1 Procurement Network Strategy

4.2 SYSTEM ARCHITECTURES USED IN PRIVATE INDUSTRY

Private industry's approach to the implementation of EDI has almost always been based on a large buyer dictating capabilities and requirements to smaller suppliers.

That approach works fine in a one-to-one situation, but even then it has problems. For example, if your machine shop sells parts to both Companies A and B, you will likely have to have two completely separate means of getting data from your system into theirs. Common industry approaches are:

- *Microcomputer-to-trading-partner's-mainframe method*
This method utilizes either translation software or data input screens at the microcomputer level. Once data have been entered or translated, the trading partner's mainframe computer is contacted by telephone, and the data are transferred. Data waiting

for the microcomputer-based company are usually transferred to the microcomputer at that time.

- *Mainframe-to-mainframe approach*

This method utilizes translation software at the mainframe level although applications software may have been modified to produce X12 standard format directly. Once a sufficient amount of data is accumulated at one mainframe computer, that computer communicates with the other by telephone. Otherwise, this method is similar to the previous method.

- *Microcomputer or mainframe via electronic mail network to trading partner's mainframe method*

This method is similar to the two previous methods, with the exception that an electronic mail network serves as a link between the two trading partners. In addition, that network may also perform translation functions. One major advantage of a system based on electronic mail is that a single network may have access to many different trading partners. In fact, an entire industry group of EDI VANs specialize in electronic mail for EDI purposes.

4.3 APPLICATION INTEGRATION

Application integration is where the real value of EC through EDI becomes most evident. An organization that feels that it can benefit from this technology without becoming committed to implementing it fully will lose money and time in the long run. Initial steps along the way will in fact be "paving the cow paths" of the past, but the intent of the DoD from the beginning is to go *all paperless as soon as possible!* Half steps won't get you there.

Given that this is the direction in which DoD plans to go, what steps should you take now? First, look at your systems with fresh eyes. Forget the bottlenecks that exist and play "What if" with the power of the computer and the network. It is not at all unreasonable to come up with a system which does away almost completely with such things as invoices, duplicate copies of *any* piece of correspondence (including electronic, of course), multiple contract files, and so on. However, the path from here to there is not the automation of the paper, nor the paving of the cow path. It is your intelligent examination of your current applications, finding the functionality in them which can be enhanced by electronic interchange both to and from. You will probably find procedures for which there is no need whatsoever. Fine, get rid of them. More importantly, you will discover that you now have capabilities that in the past you could only wish for, if you just make a few changes at your end.

4.4 TRANSLATION

Translation is the automated process of translating the proprietary data into ASC X12 standard for sending data and reversing that process for receiving data. The translation program uses "table

driven" subroutines to generalize processing regardless of the actual application being processed. Specific action is taken by the program depending on the data being processed and the particular tables associated with the transaction set.

The ASC X12 standard defines the results of the processing, not how a program is designed nor how it operates. As a consequence, commercial software packages provide "core translation" and other related functions designed to support different EDI environments. Their costs range from a few hundred dollars to \$200,000. The translation software decision to "make or buy" must consider many factors; however, the availability of a relatively inexpensive, proven commercial software packages supported by a growing industry should make development unnecessary. EDI software should be managed as "system software" versus "application software."

5.0 MAINTENANCE

This chapter describes the procedures for maintaining the DoD guidelines and conventions. It also presents a section on version/release timing.

5.1 MAINTAINING GUIDELINES

The DLA, as DoD's Executive Agent for EDI and PLUS, has established a joint program office to oversee implementation of EDI. Some of the functions of this program office are to maintain configuration control of related standards and common support packages (e.g., versions of ASC X12 standards and PLUS algorithms employed), participate in the standards-setting process, and ensure compliance with approved EDI standards.

To accomplish these functions, the joint program office has established a conventions and standards development and maintenance process whose objectives are: (1) to obtain ASC X12 data requirements from the DoD Components and present the requirements to the ASC X12 for consideration as ANSI standards, and (2) to develop and maintain conventions for use by DoD Components and their potential trading partners.

To take advantage of, and not duplicate, existing data standardization processes, the EA has established focal points within the ASD Offices, the Military Services, and the Defense Agencies from which EDI information is obtained and disseminated.

5.1.1 Development and Maintenance of DoD Conventions

The EA's primary source of information about DoD's data requirements is the EDI Users Group. That group is chaired by a representative of the ASD(P&L) and consists of representatives from OSD offices, Military Services, and Defense Agencies. It recommends the establishment of working groups to facilitate consensus among the DoD Components with regard to DoD conventions and DoD's voting position at ASC X12 meetings. The EDI Users Group also provides support for EDI education and training.

Changes to this publication and recommended changes to ANSI ASC X12 should be forwarded through your organizational point of contact for data standardization to:

EDI Standards Coordinator
ATTN: DLA-ZIE
Cameron Station
Alexandria, VA 22304-6100

See Chapter 9.0 for reproducible forms.

5.1.2 The Defense Logistics Standard Systems (DLSS) and Defense Transportation EDI

Since 1962, the Defense Logistics Standard Systems (DLSS) have provided procedures for communicating requirements, moving materiel, and performing other inter-Service tasks needed to support the continuing operation of DoD's logistics systems.

Meeting the challenges of the next decade will require a new approach, new standards, and new technology.

In 1984, a program called Modernization of Defense Logistics Standard Systems (MODELS) was initiated to meet this challenge through the efforts of its inter-Service/Agency Functional Working Group. The MODELS program has developed new EDI logistics transactions conforming to ASC X12 EDI standards. MODELS has also conducted live tests and simulations to explore various methods of evolving from the current fixed-length DLSS transaction to the more flexible variable-length ASC X12 transaction sets.

To capitalize on EDI advances in commercial transportation, the Defense Transportation EDI (DTEDI) project was initiated. The DTEDI Committee worked closely with industry, carriers, and business standards groups to develop an ASC X12 transaction set acceptable to both DoD and industry. The success of this project demonstrated the feasibility of adopting ASC X12 standards for internal as well as external DoD use.

The positive results of these efforts provide the basis for evolution of DLSS to a modernized system incorporating the full functionality of the existing DLSS and the enhanced capabilities and technical improvements resulting from MODELS and DTEDI.

This future system is called the Defense Logistics Management System (DLMS). Through the use of ASC X12 standards and supporting technology base, DLMS will provide maximum flexibility in supporting DoD's internal and external logistics information needs.

The DoD Executive Agent for EC/EDI/PLUS is working closely with the Defense Logistics Standard System Division to ensure a coordinated DoD position with respect to the ASC X12 standards development and maintenance process. Military Services and Agencies should continue to utilize existing procedures for administration of DLSS.

5.2 MAINTAINING X12 STANDARDS

Chapter 9.0, Section 9.1 provides an explanation of the ANSI ASC X12 organization, standards process, standards background, and forms extracted from the *X12/DISA Information Manual*, fall 1990 and spring 1991.

5.3 VERSION/RELEASE TIMING

Identification of the official "version" of a standard is critical to the successful interchange of information. Each participant must be able to send and receive the same version to ensure the accuracy of the information exchanged.

The version is transmitted as a 12-character code in the Functional Group Header segment (GS) in Data Element #480, Version/Release/Industry ID. This 12-character code is used by ASC X12 as follows:

<u>Position</u>	<u>Content</u>
1-3	Version number
4-5	Release level of version
6	Subrelease
7-12	DoD/Industry or Trade Association ID

ASC X12 assigns the codes in positions 1 through 6.

A major version (1-3) will change only after an official public review cycle, leading to republication of a new American National Standard.

Release level of each new major version (4-6) will begin at "000" and incremented by 1 for each new ASC X12 approved publication cycle, usually once a year. The fifth character designates the release and the sixth character designates the subrelease.

DoD/Industry/Trade Association ID (7-12) is used to identify conventions. For this suffix, DoD will use "DoD0" with the 10th character identifying successive publications. The 11th and 12th characters may be used by the Military Departments or Defense Agencies.

The official Version/Release/DoD ID for this publication is included in the page number of the Transaction Sets found in Section 10.7. For example, in page number 810.002002DoD0.1, the Version/Release/DoD ID is "002002DoD0." This number may be different for each transaction set.

DoD conventions for using ASC X12 standards are fully approved by ASC X12 and published annually as Draft Standards for Trial Use (DSTUs). Conventions developed for each release will be maintained for 4 years. Military Services and DoD Agencies will determine which release to use on the basis of business need but will not use any release more than 4 years old without approval of the DoD EA.

5.4 PROPOSED CHANGES

Future publications of the implementation guidelines will include conventions for the following DSTUs:

- 824 Application Advice, which provides the ability to report the results of an application system's data content edits of transaction sets.
- 832 Price/Sales Catalog, which provides the format and establishes the data contents of a price/sales catalog transaction set.
- 836 Contract Award, which provides the ability to notify the seller or other interested parties that the contract has been awarded and that it contains some indefinite features, such as delivery schedule, location, and/or quantities.
- 841 Specifications/Technical Information, which can be used to exchange a complete or partial technical description (text, graphic, tabular, image, spectral, or audio data) of a product, process, or service over the same communication path as any other EDI transaction.

6.0 COMMUNICATIONS

This chapter describes the computer-to-computer communications and contains information on protocols and communications options. It also presents a discussion on the impact of the Government Open Systems Interconnection Profile (GOSIP) and the General Services Administration's FTS 2000 on these options.

6.1 INTRODUCTION

Two components of EDI are the message standards and the communications options for transmitting those standards. This section provides an overview of the communications options available to an organization planning to implement EDI. Its purpose is to highlight the areas in which key data communications design decisions must be made. We do not offer any single or preferred solution; each organization must determine the proper approach based on current and projected transaction volume and level of investment. The Military Departments and Defense Agencies have telecommunications networks that could provide the required services or, at a minimum, the technical support needed to develop a telecommunications plan. The industries involved in the EDI project must be consulted early in the planning process. Service requirements beyond the capability of the DoD parent organization should be obtained from the Defense Information Systems Agency (DISA).

6.1.1 EDI Communications Network Alternatives

The following are EDI communications network alternatives:

- Dedicated networks
- Switched networks
- Network value-added services.

Dedicated networks incorporate point-to-point circuits that permanently connect two sites. The DISA's Defense Commercial Telecommunications Network (DCTN) is an example.

Switched networks employ circuit-switching, message-switching, or packet-switching technology. In each, connections between sites are made by one or more switches and the connections are broken after the transmission is completed. DISA's DDN is a packet-switched network.

Network value-added services are features provided by telecommunications networks in addition to transporting data. Common examples include electronic mail, storage, speed, and code conversion and translation. Security can also be considered a valued-added service.

An organization's own specific EDI transmission requirements, including current and future system needs, will determine the appropriate mix of these alternatives.

6.1.2 DoD Long-Haul Telecommunications Guidance

DoD has determined that its common user systems are "Warner-exempt" and that the mandatory FTS 2000 usage provisions do not apply. Therefore, long-haul connectivity requirements to support voice, data, video, and/or integrated telecommunications will be satisfied by the following:

- A DoD common-user system such as the DSN, the DDN, or a Defense Communication System (DCS) transmission system will be selected as the first choice for all new and renewed telecommunication acquisition requirements.
- The FTS 2000 will be used as the second choice when procuring telecommunications equipment that is not Warner-exempt unless DoD can establish two points to GSA's satisfaction: that the DoD requirement cannot be satisfied by the FTS 2000 procurement or that a DoD procurement would be cost-effective and would not adversely affect the cost-effectiveness of the FTS 2000. The FTS 2000 would also be the second choice for Warner-exempt telecommunications procurement if it meets the service requirements and is cost-effective.
- The last choice will be an organization-unique telecommunications acquisition for Warner-exempt and unique requirements that cannot be satisfied (technically, operationally, or cost-effectively) by either a DoD common-user system or FTS 2000.

6.2 PROTOCOLS

The options for sending EDI transactions electronically are affected by both the GOSIP and the GSA's FTS 2000 contract.

6.2.1 The Government Open Systems Interconnection Profile

GOSIP Federal Information Processing Standard 146 is in effect; it became compulsory in August 1990. GOSIP defines a common set of data communication protocols which enable systems developed by different vendors to interoperate and users of different applications on those systems to exchange information. GOSIP applies to new networking systems that permit communications between two autonomous computers. It is mandatory where it provides the required communications functionality.

6.2.2 General Services Administration's FTS 2000

The FTS 2000 contract awarded in December 1988 by GSA also affects each alternative. FTS 2000 is the second choice for DoD telecommunications. (DoD common-user systems such as DDN

are the first choice.) The FTS 2000 services are available and include the following:

- Circuit-switched data service
- Dedicated transmission service
- Switched digital integrated service
- Packet-switched service
- Electronic mail.

The circuit-switched data service will provide circuit-switched service at 56 Kbps and 64 Kbps. The dedicated transmission service provides the same data rates on a continuous basis, plus full T1 (1.5 Mbps) facilities. The integrated services will come on line with the availability of ISDN. Under ISDN, all the services listed above plus voice and video transmissions are combined on a single network and accessed through the same network connection.

6.3 POINT-TO-POINT (DEDICATED) NETWORKS

Point-to-point circuits connect users in dedicated networks. These dedicated facilities are used when EDI transactions are continual between two points. Since the users are paying for the link regardless of the number of transmissions, its usage must be high for it to be economical.

The DISA provides these circuits on DCTN as a waiver from DDN. The DCTN provides dedicated data circuits in addition to switched voice, dedicated voice, and video communications for DoD's CONUS operational support requirements. The services are provided by AT&T under a fixed-rate, leased services contract that runs through February 1996.

The DCTN incorporates satellite communications as well as terrestrial facilities.

The telecommunications protocols used to send data across DCTN depend on the users at each end of the line.

6.3.1 Impact of Government Open Systems Interconnection Profile

GOSIP's X.25 protocol should be used when connecting two distant host computers through a dedicated circuit. It provides a nonproprietary solution although it is less efficient than other options for sending data across a dedicated circuit. It offers a smooth transition onto a packet-switched network if that becomes desirable.

6.3.2 Impact of FTS 2000

The FTS 2000 contract provides a dedicated-circuit option. It offers analog data circuits at data transmission rates up to 4.8 Kbps and at 9.6 Kbps. Digital, synchronous, full-duplex, service will be available at 9.6 Kbps and 56 Kbps (64 Kbps in the future). A T1 (1.5 Mbps) service is also offered for high-speed dedicated network connections.

6.4 THIRD-PARTY SERVICES (SWITCHED NETWORKS AND VALUE-ADDED SERVICES)

Switched networks connect and disconnect circuits as required to transmit data. The three common methods are

- Circuit switching
- Message switching
- Packet switching.

Circuit switching is used in the public telephone systems. A circuit is dedicated between the source and destination for the duration of the transmission. For data, as in telephone calls, the destination must be available before the connection can be completed.

Message-switching networks package the data in messages and pass the messages from switch to switch. The sender and receiver do not have to be available at the same time since the message is stored at each intermediate step. For that reason, message-switching networks are also referred to as store and forward networks. The Automatic Digital Network (AUTODIN) is a message-switching network.

Packet switching is similar to message switching, but it divides the data into smaller, equal-size pieces called packets. It takes less time to move data through the network since large messages do not have to be stored at each intermediate switch. The reduced delay, over message switching, allows the two users to carry on a dialog, referred to as an interactive process. In addition, the reduced delay aids transaction processing by moving the transactions to their destinations quickly.

Packet switching's advantage over circuit switching is in making efficient use of the data lines. Since each packet carries a destination address, packets from multiple sources heading to different destinations can be transmitted down the same data line if desirable.

The DDN is a packet-switching network for DoD's data communication needs. It includes about 2,000 hosts with an estimated 50,000 users, and has a maximum data rate of 56 Kbps. Although the data rate between the switches may be increased

to 1.5 Mbps, DoD does not now plan to increase the data rates at the user connection. The network uses TCP/IP and X.25 standards. Those protocols must also be resident on each user's system for connection to the network. Each user follows the same method, the File Transfer Protocol (FTP) for file transfers, and the Simple Mail Transfer Protocol (SMTP) for electronic mail. Each user can send and receive data with any other allowed user who has a connection to the network.

6.4.1 Impact of Government Open System Interconnection Profile

The GOSIP specifies the 1984 International Consultative Committee on Telegraphy and Telephony (CCITT) X.25 recommendations for wide-area communications. ISDN will be incorporated into Version 2 of the GOSIP as another alternative. As with X.25, ISDN is a subnetwork technology for supporting the higher level GOSIP protocols.

The DDN implementation of X.25 is based on the 1980 CCITT X.25 recommendations. The DDN standard service assumes the use of the TCP/IP protocols and supports the following:

- Logical addressing
- Precedence and preemption
- Additional diagnostic codes
- 1822DH and HDH interoperability.

It cannot support the following:

- X.25 closed user groups
- Reverse billing
- Account negotiation
- D-bit modification.

DDN also offers a basic service that has full performance capabilities and is compatible with the commercial and international networks. The basic and standard service cannot be accessed through the same DDN connection.

6.4.2 Impact of FTS 2000

Circuit-switched data service will be available at 56 Kbps (64 Kbps in the future). A 7-digit numbering plan will be employed by the prime contractor (AT&T for DoD) for accessing other users. The numbering plan may be integrated with the switched-voice numbering plan at the discretion of the prime contractor.

The packet-switching services provided under FTS 2000 will conform to the 1984 CCITT X.25 recommendations. The default

packet size will be 128 bytes but the size will be adjustable from 64 to 256 bytes. Access will be through dial-up asynchronous connections at 300 bps, 1.2 Kbps, and 2.4 Kbps; dial-up synchronous connections at 4.8 Kbps; and dedicated access at speeds up to 4.8 Kbps, 9.6 Kbps, and 56/64 Kbps.

The digital integrated service will provide both circuit and packet switching through the same network interface. An ISDN and a T1 interface will be offered.

The basic rate ISDN interface accesses two 64-Kbps channels and one 16-Kbps signaling channel. Those three channels are combined to comprise one basic-rate ISDN circuit. The signaling channel carries the information for configuring the two 64-Kbps channels in either the circuit-switched or packet-switched mode. Users who require a large burst of data for EDI can request a circuit-switched connection. Those whose needs include idle time, such as an interactive sessions, should request the packet-switched connection. Both are provided on the same connection.

Two different T1 interfaces will be provided under the T1 portion of the Switched Digital Integrated Service. The first type divides the 1.544-Mbps circuit into 24 channels. The second provides 48 switched data channels.

6.4.3 Network Value-Added Services

Communications networks now offer services beyond merely moving data from one site to another. They provide electronic mail, data storage, and speed and format conversion or translation. The term VANs often refers to the public data networks such as Tymnet and Telenet. Those network services may be provided by DISA, FTS 2000, or the public data networks.

Electronic mail allows users to send text such as letters and memos for later retrieval by another network user. Work is under way to incorporate EDI transactions into an electronic mail message.

Data storage is an auxiliary storage on the network to hold files until the recipient is ready to receive them.

Speed is converted through the intermediate switches. The data are buffered at each switch so the speed at which the data enter the switch can be different from the speed at which the data leave. That conversion is possible in message switching and packet switching but not circuit switching. In circuit switching, the sender and receiver are connected and must operate at the same speed.

In format conversion, the data are translated from the sender's format to the receiver's format. For EDI participants, that conversion may mean translating from a non-EDI format to EDI before sending the data to the destination. The conversion may also take place between two similar applications, such as from one electronic mail system to another. Two examples are the

application layer gateways that will be placed on DDN to handle messages going between SMTP and message handling systems (MHS) and files between FTP and File Transfer, Access, and Management Protocol (FTAM) systems.

6.5 NETWORK INTERCONNECTIONS

Most industries have contracted with commercial network providers for a variation of the alternatives rather than develop their own networks. Most of the network providers have specialized in the following EDI services:

- Data standard support
- Translation software
- Protocol conversion
- Mailbox service
- Network billing.

7.0 DoD BUSINESS MODELS

This chapter presents a narrative describing how EDI functions within several business areas. These examples are provided to assist you in developing your own applications.

7.1 GENERAL BUSINESS MODEL

The model shown in Figure 7.1-1 depicts the logical flow of EDI transaction sets (data) that have DoD conventions. The model will be updated as new conventions are added.

7.2 SMALL BUSINESS MODEL (to be published)

7.3 ORDERING SUPPLIES OR SERVICES

There are two basic categories of electronic purchase orders: purchase orders issued against existing contracts and individual purchases. The models, Figures 7.3-1 and 7.3-2, are at the highest level of data flow and are meant to convey concepts which can be expanded upon and implemented.

7.3.1 Indefinite Delivery Contracts

Multi-item indefinite delivery contracts usually result in the establishment of a multi-year business relationship with a commercial vendor and create an ideal environment for EDI. Figure 7.3-1 depicts the logical data flow associated with ordering supplies and services using EDI in support of a multi-item indefinite delivery contract. Purchase orders, using transaction 850, are issued by DoD against the contract as material is required. A purchase order acknowledgment (transaction 855) is returned by the vendor to confirm acceptance of each order. When the material is shipped, a ship notice (transaction 856) is sent by the vendor to DoD followed by an invoice (transaction 810). Upon notice of receipt (transaction 861) DoD would initiate an EFT payment and payment order/remittance advice (transaction 820). Functional acknowledgments (transaction 997) are returned by DoD and vendor during the exchanges to provide a positive response that the contents of the transmission were ANSI ASC X12 syntactically correct.

7.3.2 Individual Purchases

Although more complex, EDI can be used to purchase common items whose specifications are well known to both DoD and vendor. Figure 7.3-2 depicts the logical data flow where there is no contract. The DoD sends a RFQ (transaction 840) to one or more vendors. The vendors respond with a quote (transaction 843). The DoD then sends a purchase order (transaction 850) to the vendor of choice. The vendor acknowledges (transaction 855) to confirm acceptance. When the material is shipped, the vendor sends a notice (transaction 856) to DoD followed by an invoice (transaction 810). Upon notice of receipt (transaction 861), DoD initiates an EFT payment and payment order/remittance advice

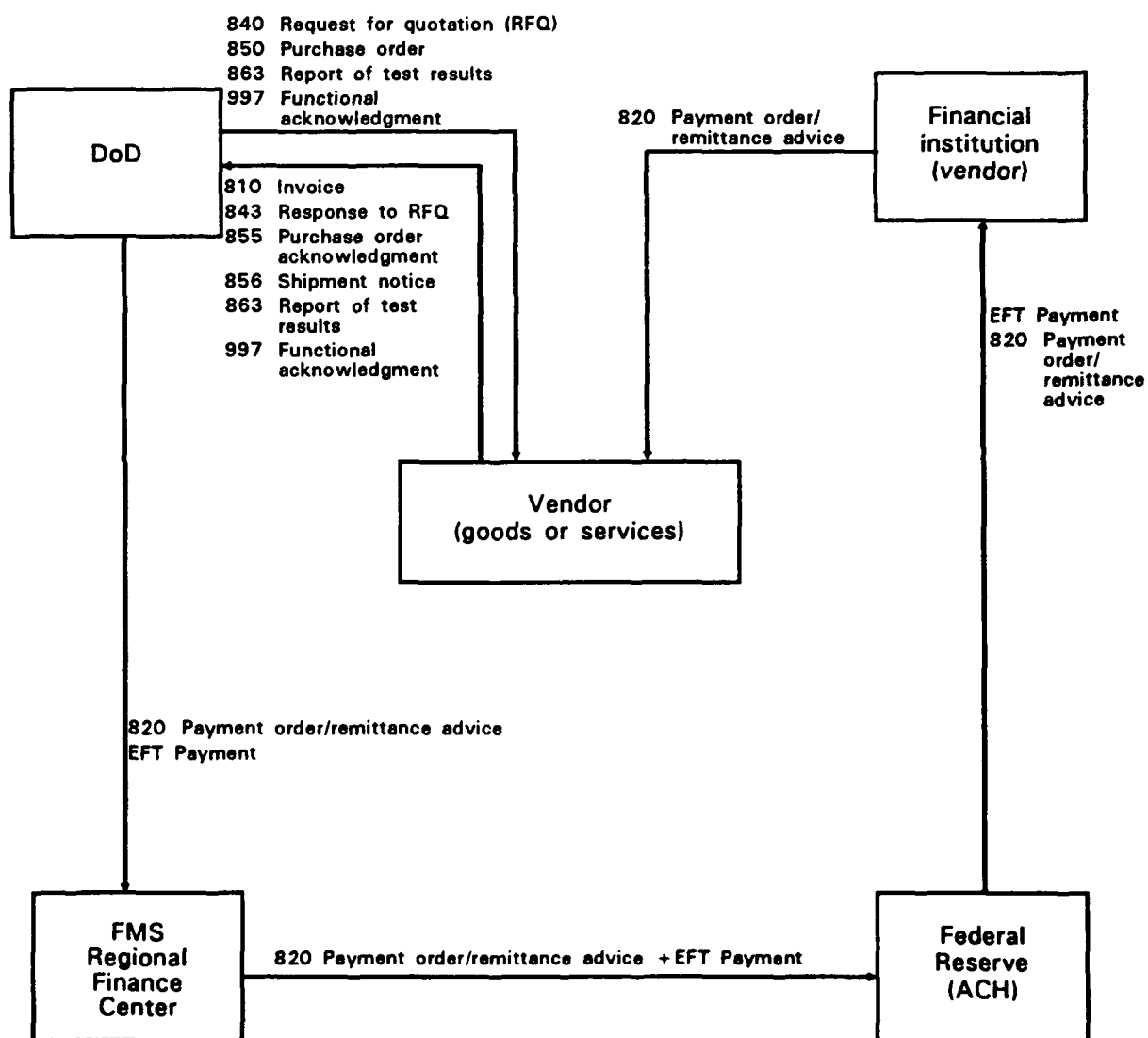


Figure 7.1-1 General Business Models

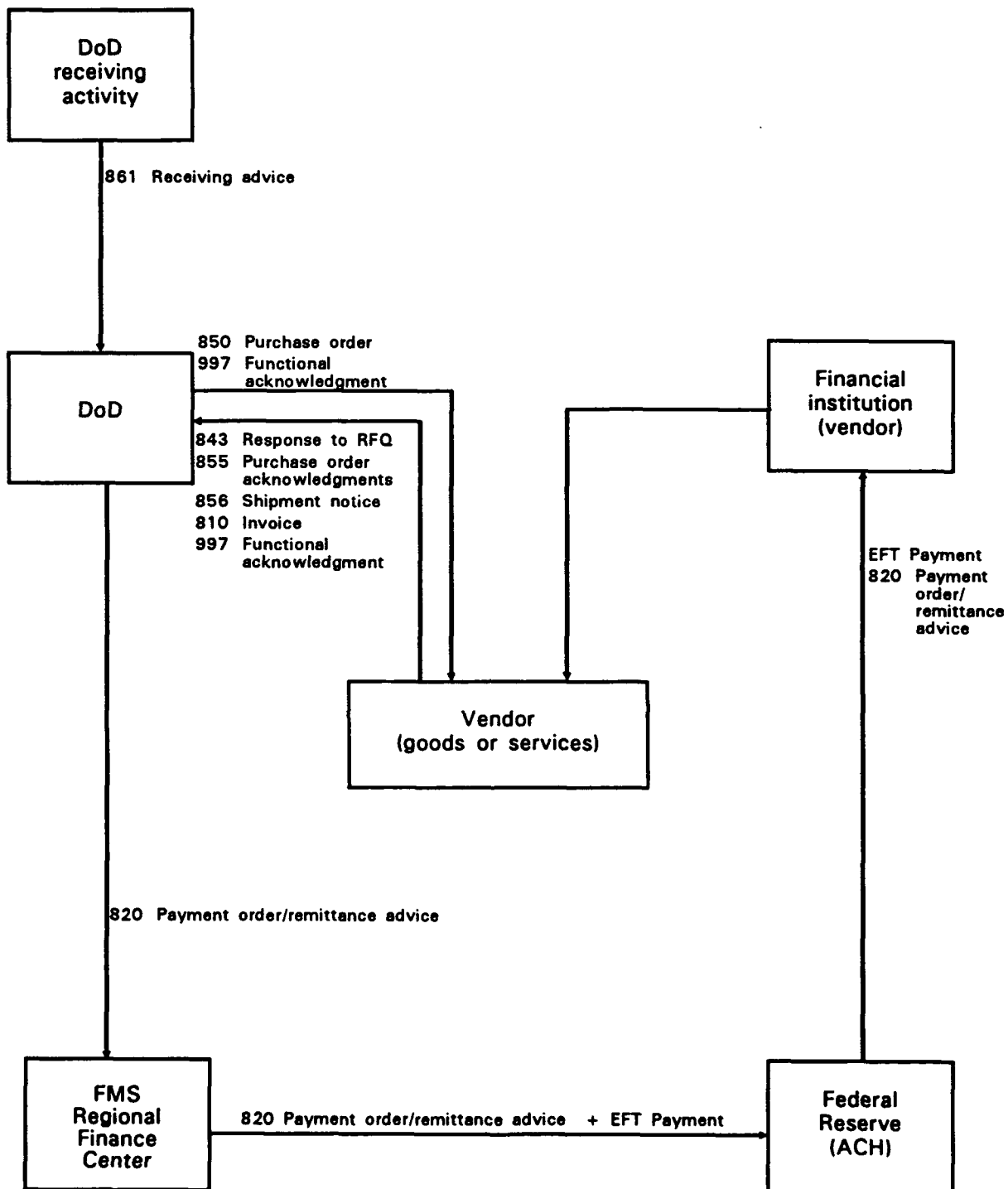


Figure 7.3-1 Indefinite Delivery Contract

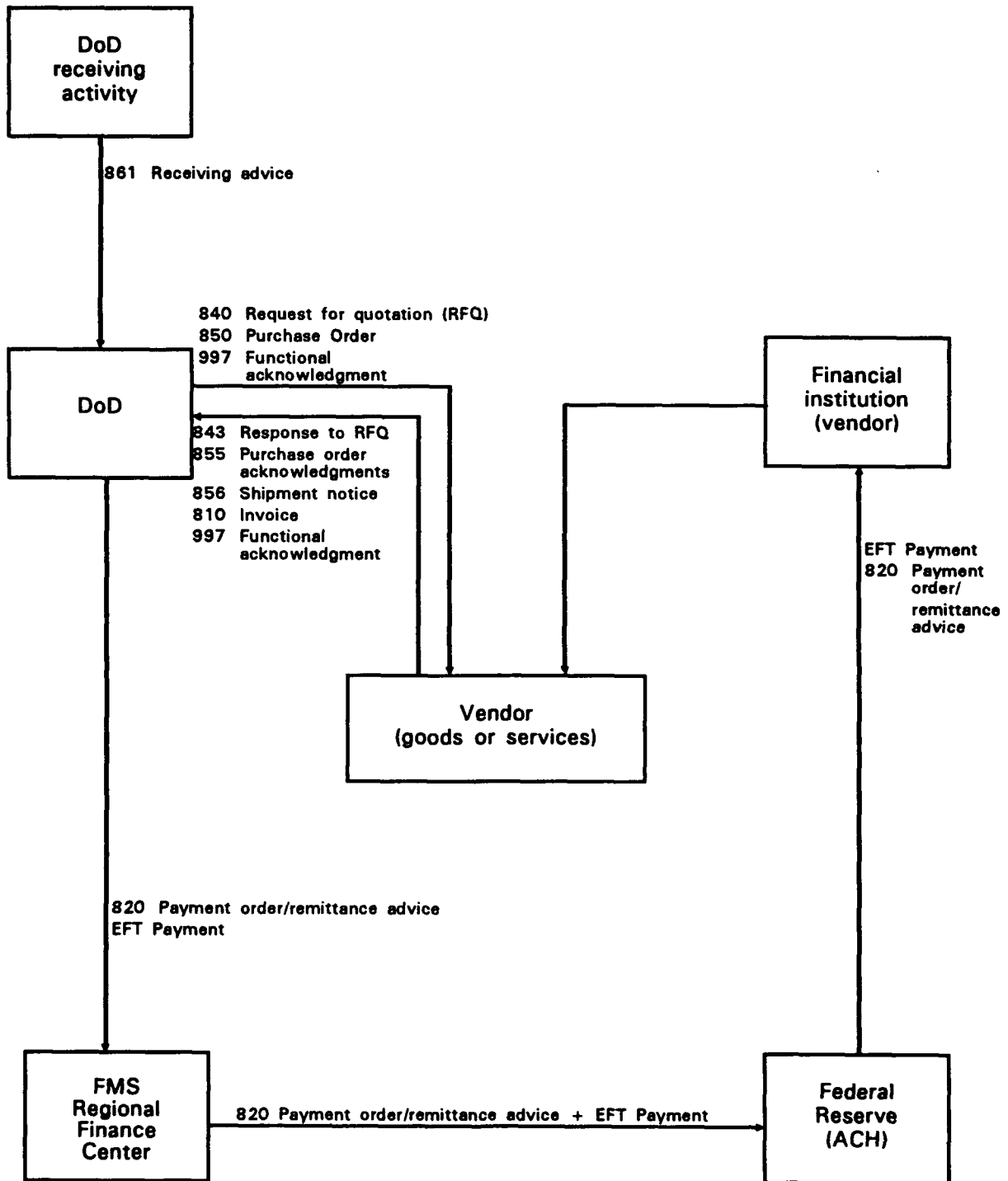


Figure 7.3-2 Individual Purchases

(transaction 820). Functional acknowledgments (transaction 997) are returned by DoD and vendor during the exchanges to provide a positive response that the contents of the transmission were ANSI ASC X12 syntactically correct.

7.4 COMPUTER-AIDED ACQUISITION AND LOGISTIC SUPPORT (CALS)

EDI and CALS are complementary programs to support the development of standards that enable computer systems to exchange digital data.

In a 26 July 1990 letter to the National Security Industrial Association, the ASD(P&L) stated

DoD recognizes the importance to both industry and DoD of being able to respond to both CALS and EDI requirements with a single integrated system. We are pursuing common technical solutions for interchanging CALS and EDI information. We are supporting provisions for including CALS data within EDI transactions and are committed to the use of EDI transactions in CALS whenever appropriate.

Progress has been made by the EDI and CALS Government and industry groups on the integration of the initiatives. Figure 7.4-1 is a proposed model of a CAL/EDI relationship. The specifications/technical information transaction set can be used to transmit CALS Automated Interchange of Technical Information (MIL-STD-1840A) data specifications, or technical information between trading partners. It can also be used by EDI trading partners to exchange a complete or partial technical description of a product, process, service, etc., over the same path as any other EDI transaction. The detailed data can include graphic, text, parametric, tabular, image, spectral, or audio data.

Transaction set 841 was designed to be used in conjunction with other EDI general business transactions in a standard EDI transmission. A DoD convention is being developed for its use and will be published in the next release of the Implementation Guidelines.

7.5 ELECTRONIC FUNDS TRANSFER CORPORATE TRADE EXCHANGE RULES

The Department of Defense is a participant in the Vendor Express program managed by Financial Management Services (FMS), a bureau of the Department of the Treasury. Vendor Express is a generic term used to describe the conversion of the Federal Government's vendor and miscellaneous payments to the Automated Clearing House (ACH) network.

The ACH network provides a reliable payment mechanism that eliminates problems with lost, stolen, or forged checks. The payments are deposited directly to the vendor's financial institution

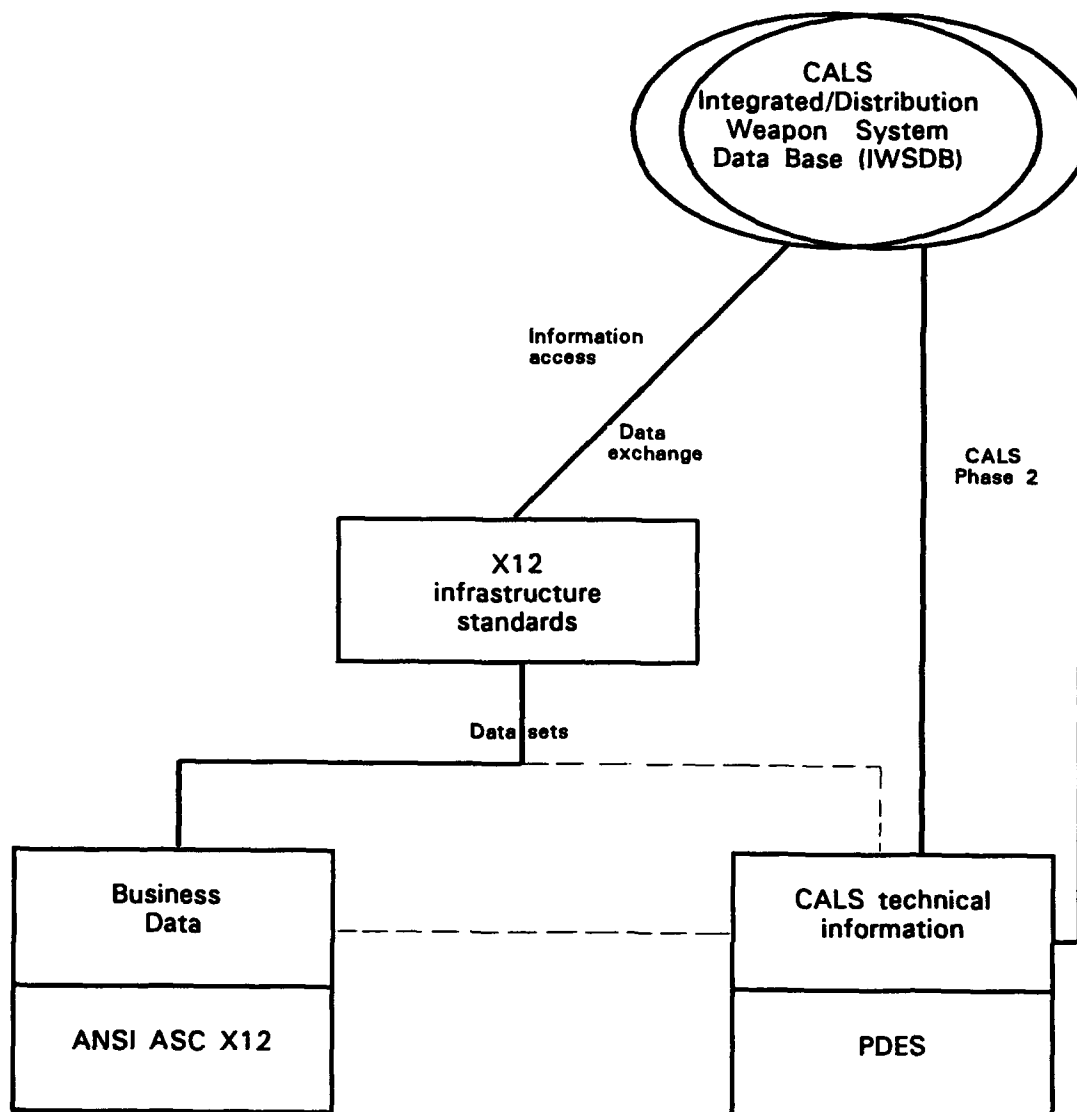


Figure 7.4-1 CALS/EDI X12 Standards Relationship

account on the payment date utilizing the National Automated Clearing House Association (NACHA) rules.

A key feature of the program is the use of addenda records utilizing EDI (ANSI ASC X12 standards) to transmit accounting information with the payment.

The combination of payment and payment information allows the vendor to apply this information upon receipt and saves reconciliation time. In general, EDI provides a basis for complete end-to-end automation of order entry information.

There are two corporate (vendor) ACH standard entry classes which may utilize EDI in the addenda record: CCD-Plus and CTX.

- *Cash Concentration or Disbursement entry with a Special Addenda Record, or "CCD-Plus"*
For CCD-Plus entries, only one addenda record may accompany each entry and is restricted to 80 characters of ASC X12.4, Payment Order/Remittance Advise data segments and elements. (Single payment, single invoice.)
- *Corporate Trade Exchange, or CTX*
For CTX entries, Figure 7.5-1, more payment information can be relayed by using the full capabilities of the EDI standard. (Single payment, multiple invoice.)

7.5.1 Payment Information Process

In Figure 7.5-2, the vendor (contractor) bills the DoD activity for the goods/services provided. The DoD activity authorizing the payment forwards the payment and the payment information to FMS Regional Finance Center. The center forwards the payment and accompanying information to the appropriate Federal Reserve Bank.

The Federal Reserve Bank forwards the payment and accompanying information to the vendor's financial institution. The financial institution deposits the payment in the vendor's account and forwards the payment information to the vendor.

7.5.2 Potential Benefits of EFT/EDI

All participants (vendors, financial institutions, and DoD) have the potential to benefit from EFT/EDI. In addition to the usual benefits of EDI (see Chapter 1, Section 4) there are some specific areas such as the elimination of lost, stolen, or forged checks that result directly from EFT/EDI.

Vendors can expect to benefit from having usable funds on the payment day. This certainty of funds can have a significant impact on other financial transactions. Disputes due to mail delays will also be a thing of the past. With the data available in a form easily integrated into other internal systems such as accounts receivable, there should be a reduction in the cost of manual processing and paper handling.

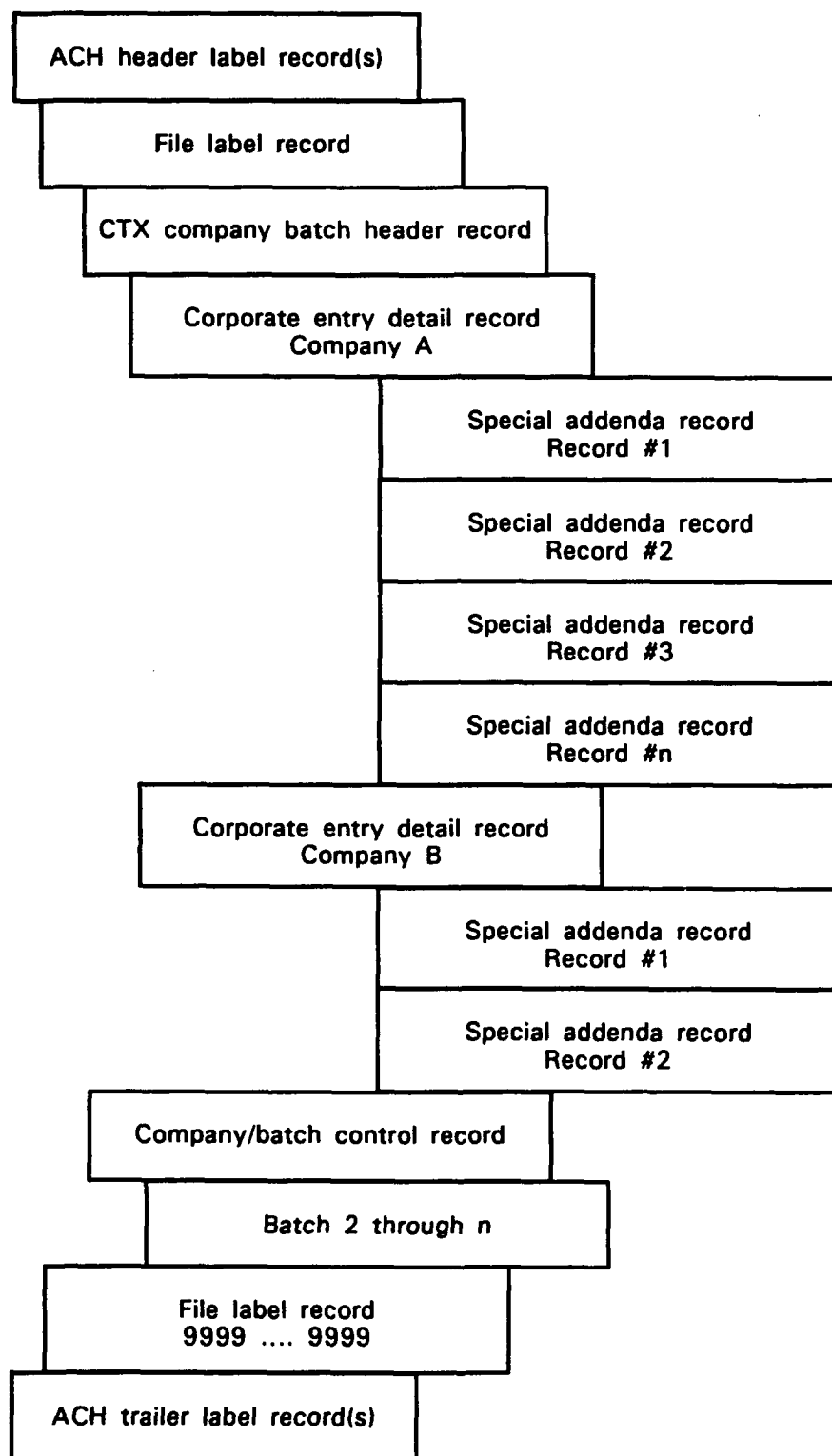


Figure 7.5-1 Diagram of Sequence of Records for CTX Entries

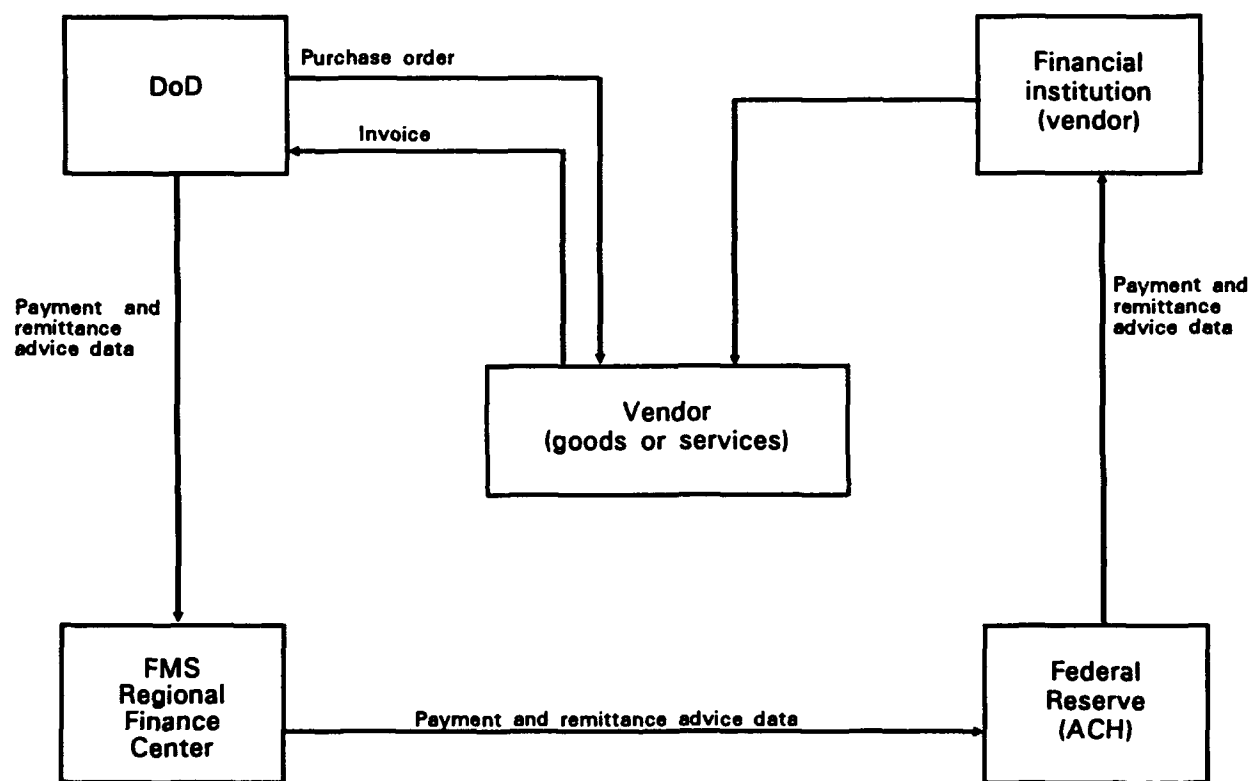


Figure 7.5-2 EFT/EDI - Dollars and Data Together

Financial institutions will also benefit from the increased level of automation. They have the opportunity to become more responsive to their customer's needs by providing additional cash management and transaction processing services.

For DoD and the Federal Government, EFT/EDI provides a less expensive method of payment. The Department of the Treasury estimated the cost to issue a check was reduced by 26 cents through the use of EFT/EDI. In 1989, this saved the U.S. taxpayers \$90 million. The increase in automation also strengthened payment and accounting controls and boosted productivity. Over 1 million payments were issued per regional finance center employee in 1989.

The EFT/EDI provides all participants an opportunity to reexamine their approach to financial management and change to benefit their customers and themselves.

7.5.3 Implementation Issues

Not all Military Service organizations or Defense Agencies have the capability to pay using EFT, but this is rapidly changing.

A schedule of DoD activities currently or projected to have EFT/EDI capability can be obtained from the Department of the Treasury, Marketing Branch, Payments Management Division, Washington, DC 20227.

7.5.4 How to Get Started

DoD vendor's wishing to participate in the Vendor Express program should first contact the Military Service organization or Defense Agency with which it does business. The DoD organization will provide additional information and assistance. The first step is to complete the "Company Information" section of the — Standard Form 3881, "Payment Information Form," provided by the DoD activity.

This form is then taken to the vendor's financial institution. Agreement must be reached as to how the payment information (addendum) will be provided to the vendor. This could be by customer's statement, magnetic tape, on-line query, or telephone. EDI is the preferred method if your internal accounting processes are automated to take advantage of direct entry of data. The financial institution's ACH coordinator will then complete the "Financial Institution" portion of the form. The vendor should then return the form to the DoD activity they are doing business with.

The DoD activity will coordinate with all participants to complete the technical requirements and testing. Production will begin after successful testing and with the approval of all participants.

8.0 GLOSSARY

This chapter contains ASC X12 and DoD specific glossaries.

8.1 X12 GLOSSARY

AIA

Aerospace Industry Association

AIAG

Automotive Industry Action Group

AISI

American Iron and Steel Institute

ANSI

American National Standards Institute

ANSI Standard

A document published by ANSI that has been approved through the consensus process of public announcement and review. Each of these standards must have been developed by an ANSI committee and must be revisited by that committee within 5 years for update. See Draft Standard for Trial Use (DSTU).

API

American Paper Institute; American Petroleum Institute

Application Acknowledgment

A transaction set whose purpose is to return a response to a transaction set that has been received and processed in an application program. The Purchase Order Acknowledgment Transaction Set 855 is an example of an application acknowledgment. It is used to respond to the Purchase Order Transaction Set 850 presenting such things as whether the receiver can fulfill the order and if it can be done on time.

Application Advice (824)

A transaction set that accepts, rejects, or identifies errors in the content of any transaction set beyond the normal syntax checks.

Area Transaction Set

Identifies a predefined area within a transaction set (header, detail, summary) containing segments and their various attributes.

ASC X12

Accredited Standards Committee, X12 comprises industry members who create EDI standards for submission to ANSI for subsequent approval and dissemination; or for submission to the UN/ECE for approval and submission of UN/EDIFACT standards.

ATA

American Trucking Association; Air Transport Association

Authentication

A mechanism which allows the receiver of an electronic transmission to verify the sender and the integrity of the content of the transmission through the use of an electronic "key" or algorithm which is shared by the trading partners. This is sometimes referred to as an electronic signature.

BSR

Bureau of Standards Review

CEC

Commission of the European Communities

CIDX

Chemical Industry Data Exchange

CMEA

Council for Mutual Economic Assistance

Compliance Checking

A checking process that is used to ensure that a transmission complies with ANSI X12 syntax rules.

Composite Data Element

One or more component data elements delimited by subelement separators. Currently, this is used only in the EDIFACT standards.

Conditional (C)

A data element requirement designator which indicates that the presence of a specified data element is dependent on the value or presence of other data elements in the segment. The condition must be stated and must be computer processable.

Control Segment

A Control Segment has the same structure as a Data Segment but is used for transferring control information for grouping data segments. Control Segments are Loop Control Segments (LS/LE), Transaction Set Control Segments (ST/SE), and Functional Group Control Segments (GS/GE), defined in X12.6, and Interchange Control Segments (ISA/IEA/TA1) defined in X12.5.

Control Validation

Confirmation that information within the control segments is correct.

Data Element

The basic units of information in the EDI standards containing a set of values that represent a singular fact. They may be single-character codes, literal descriptions, or numeric values.

Data Element Length

This is the range, minimum to maximum, of the number of character positions available to represent the value of a data element. A data element may be of variable length with range from minimum to maximum, or it may be of fixed length in which the minimum is equal to the maximum. (X12.3)

Data Element Reference Number

Reference number assigned to each data element as a unique identifier.

Data Element Requirement Designator

A code defining the need for a data element value to appear in the segment if the segment is transmitted. The codes are mandatory (M), optional (O), or conditional (C).

Data Element Separator

A unique character preceding each data element that is used to delimit data elements within a segment.

Data Element Type

A data element may be one of six types: numeric, decimal, identifier, string, date, or time.

Delimiters

The delimiters consist of two levels of separators and a terminator. The delimiters are an integral part of the transferred data stream. Delimiters are specified in the interchange header and may not be used in a data element value elsewhere in the interchange. From highest to lowest level, the separators and terminator are segment terminator, data element separator, and subelement separator (only used in EDIFACT).

DISA

Data Interchange Standards Association. A nonprofit organization funded by X12 which serves as the Secretariat for X12.

Direct Transmission

The exchange of data from the computer of the sending party directly to the computer of the receiving party. A third-party value-added service is not used in a direct transmission.

DSTU

Draft Standard for Trial Use. Represents a document approved for publication by the full X12 committee following membership consensus and subsequent resolution of negative votes. (Final Report of X12 Publications Task Group). The Draft EDI Standard for Trial Use document represents an ASC X12 approved standard for use prior to approval by ANSI. See ANSI Standard.

EB

The EDIFACT Board

EBCDIC

Extended binary-coded-decimal interchange code

EC

European Community; electronic commerce

EDI

Electronic Data Interchange. The computer application to computer application exchange of business information in a standard format.

EDICC

Electronic Data Interchange Council of Canada

EDIFACT Board

Advisory and Support Team for a number of the UN/EDIFACT Rapporteurs

EDI Translation

The conversion of application data to and from the X12 standard format

EDI Translator

Computer software used to perform the conversion of application data to and from the X12 standard.

EDX

Electrical Data Exchange

EFTA

European Free Trade Association (Austria, Finland, Iceland Norway, Sweden, and Switzerland)

EIDX

Electronics Industry Data Exchange

Electronic Envelope

Electronic information which binds together a set of transmitted documents being sent from one sender to one receiver.

Element Delimiter

A single-character which follows the segment identifier and separates each data element in a segment except the last.

Electronic Mailbox

A term used to refer to the place where an EDI transmission is stored for pickup or delivery within a third-party-service provider's system. Trading partners can also maintain mailboxes within their own domains.

EM

Electronic Mail

Encryption

A process of transforming clear text (data in its original, un-encrypted form) into ciphertext (encryption output of a cryptographic algorithm) for security or privacy. (Security Transaction Set 815).

FASLINC

Fabric and Suppliers Linkage Council

Functional Acknowledgment

A transaction set (997) transmitted by the receiver of an EDI transmission to the sender, indicating receipt and syntactical acceptability of data transmitted according to the ASC X12 standards. The functional acknowledgment allows the receiving party to report back to the sending party problems encountered by the syntax analyzer as the data are interpreted. It is not intended to serve as an acknowledgment of data content. See also X12.6.

Functional Group

A group of one or more transaction sets bounded by a functional group header segment and a functional group trailer segment.

Functional Group Segments

GS/GE segments identify a specific functional group of documents such as purchase orders.

GCA

Graphic Communication Association

GE1

UN/ECE WP4 Group of Experts 1 for Data Elements and Automatic Data Transfer

GE2

UN/ECE WP4 Group of Experts 2 for Procedures and Documentation

Hexadecimal

Base 16 notation commonly used to represent binary value

HIBCC

Health Industry Business Communications Council

Industry Conventions

Defines how the ASC X12 standards are used by the specific industry

Industry Guidelines

Defines the EDI environment for using conventions within an industry. It provides assistance on how to implement X12 standards.

Interchange Control Segments

ISA/IEA segments identify a unique interchange being sent from one sender to one receiver (see electronic envelope).

Interchange Control Structure

The interchange header and trailer segments envelop one or more functional groups or interchange-related control segments and perform the following functions: (1) defines the data element separators and the data segment terminators, (2) identifies the sender and receiver, (3) provides control information for the interchange, and (4) allows for authorization and security information. (X12.5)

IPT

International Project Team. Advisory and Support Team of the UN/EDIFACT Rapporteur for North America.

ISO

International Standards Organization

JIT

Just in Time. JIT is the concept of reducing inventories by working closely with one's suppliers to coordinate delivery of materials just before their use in the manufacturing process.

Loop

A group of semantically related segments; these segments may be either bounded or unbounded (X12.6). The N1 loop is an example of a loop, which includes segments N1 to PER for name and address information.

Mandatory (M)

A data element/segment requirement designator which indicates the presence of a specified data element is required.

Mapping

The process of identifying the standard data element's relationship to application data elements.

Max Use

Specifies the maximum number of times a segment can be used at the location in a transaction set

Message

Entire data stream including the outer envelope

NACHA

National Automated Clearing House Association

NPTA

National Paper Trade Association

Optional (O)

A data element/segment requirement designator which indicates the presence of a specified data element/segment is at the option of the sending party which can be based on the mutual agreement of the interchange parties.

PIDX

Petroleum Industry Data Exchange

Proprietary Format

A data format specific to a company, industry, or other limited group. Proprietary formats do not comply with the ASC X12 series of standards.

Qualifier

A data element which identifies or defines a related element, set of elements, or a segment. The qualifier contains a code taken from a list of approved codes.

Rapporteur

An individual expert appointed by the United Nations for specific objectives

Repeating Segment

A segment that may be used more than once at a given location in a transaction set. See Max Use.

SAFLINC

Sundries and Apparel Findings Linkage Council

S.C.C. JTC/EDI

Standards Council of Canada Joint Technical Committee on Electronic Data Interchange

Security

System screening which denies access to unauthorized users and protects data from unauthorized uses

Segment

Segments consist of logically related data elements in a defined sequence. A data segment consists of a segment identifier, one or more data elements each preceded by an element separator, and ends with a segment terminator. (X12.6)

Segment Directory (X12.22)

Provides the purpose and format of the segments used in the construction of transaction sets. The directory lists each segment by name, purpose, identifier, the contained data elements in the specified order, and the requirement designator for each data element.

Segment Identifier

A unique identifier for a segment composed of a combination of two or three upper-case letters and digits. The segment identifier occupies the first-character positions of the segment. The segment identifier is not a data element. The segment identifier in EDIFACT is a component data element — part of a composite data element consisting of a segment identifier and an explicit looping designator.

Segment Terminator

A unique character appearing at the end of a segment to indicate the termination of the segment.

Subelement Separator

A unique character used to delimit the component data elements within a composite data element (only used in EDIFACT).

Syntax

The grammar or rules which define the structure of the EDI standards (i.e., the use of loops, qualifiers, etc.). Syntax rules are published in ANSI X12.6.

TALC

Textile/Apparel Linkage Council

TAMCS

Textiles/Apparel Manufacturing Communications Standards

TCIF

Telecommunications Industry Forum

TDCC/EDIA

The Transportation Data Coordinating Committee/Electronic Data Interchange Association

TEDIS

Trade Electronic Data Interchange Systems. A program of the CEC.

Trading Partner

The sending and/or receiving party involved in the exchange of electronic data interchange transmissions.

Transaction Set

The transaction set unambiguously defines, in the standard syntax, information of business or strategic significance and consists of a transaction set header segment, one or more data segments in a specified order, and a transaction set trailer segment.

Transaction Set ID

An identifier that uniquely identifies the transaction set. This identifier is the first data element of the transaction set header segment.

Translation

The act of accepting documents in other than standard format and translating them to the standard.

UCC

Uniform Code Council

UCS

Uniform Communication Standard

UISG

Utilities Industry Standards Group

UN/ECE

United Nations/Economic Commission for Europe

UNSM

A standard message to be used in electronic data interchange (EDI) between business partners which has been registered with the UN/ECE WP4.

UNTDDED

United Nations Trade Data Elements Directory standards for data fields

VAN

Value-added network. Third-party service organizations.

Version/Release

Identifies the publication of the standard being used for the generation or the interpretation of data in the X12 standard format. May be found in the Functional Group Header Segment (GS) and in the Interchange Control Header Segment (ISA). See Control Segment.

VICS Committee

Voluntary Interindustry Communications Standards for Electronic Data Interchange

WINS

Warehouse Industry National Standards guidelines

WP4

United Nations Trade Working Party 4 on Facilitation of International Trade Procedures. Responsible among others, for various initiatives on EDI.

X12

The ANSI committee responsible for the development and maintenance of standards for electronic data interchange (EDI).

X12.5

Interchange Control Structure. This standard provides the interchange envelope of a header and trailer for the electronic interchange through a data transmission, and it provides a structure to acknowledge the receipt and processing of this envelope.

X12.6

Application Control Structure. This standard describes the control segments used to envelop loops of data segments, to envelop transaction sets, and to envelop groups of related transaction sets.

8.2 DoD GLOSSARY

ACH

Automated Clearing House

AIS

Automated Information Systems

ASCENT

Control Data Corporation's commercial version of Lawrence Livermore National Laboratory's Intelligent Gateway Processor

ASD(P&L)

Assistant Secretary of Defense (Production and Logistics)

AUTODIN

Automatic Digital Network

BCAS

Base Contracting Automated System

BNR

Bell Northern Research

CAD

Computer Aided Design

CALS

Computer-Aided Acquisition and Logistic Support

CAM

Computer Aided Manufacturing

CCD

Cash Concentration or Disbursement

CCITT

International Consultative Committee on Telegraphy and
Telephony

CDC

Control Data Corporation

CFR

Code of Federal Regulations

CSM

Computer Security Monitor

CTX

Corporate Trade Exchange

DARPA

Defense Advance Research Projects Agency

DCS

Defense Communication System

DCTN

Defense Commercial Telecommunication Network

DDN

Defense Data Network

DepSecDef

Deputy Secretary of Defense

DES

Data Encryption Standard

DFARS

DoD FAR Supplement

DISA

Defense Information Systems Agency

DLA

Defense Logistics Agency

DLMS

Defense Logistics Management System

DLSS

Defense Logistics Standard Systems

DSN

defense switched network

DTEDI

Defense Transportation EDI

ECON

EC Operational Network

ECTN

Electronic Commerce Test Network

EFT

electronic funds transfer

ERS

evaluation receipt settlement

FAR

Federal Acquisition Regulation

Federal Rules of Evidence

Rules governing proceedings in the Courts of the United States, especially as to what information may be admissible before the Courts.

FMS

Financial Management Service

FOIA

Freedom of Information Act

FTAM

File Transfer, Access, and Management Protocol

FTP

File Transfer Protocol

GAO

General Accounting Office

GOSIP

Government Open Systems Interconnection Profile

GSA

General Services Administration

IAB

Internet Activities Board

ID

Identifier

IGP

intelligent gateway processor

IOC

initial operational capability

IP

internet protocol

IRM

Information Resource Management

ISA

Interchange Control Header Identifier

ISDN

Integrated Service Digital Network

IWSDB

Integrated/Distribution Weapon System Data Base

LCM

life-cycle management

LLNL

Lawrence Livermore National Laboratory

LRAM

Livermore Risk Assessment Methodology

LSA

Logistics Support Analysis

MHS

message handling systems

MLS

multi-level secure

MRP

manufacturing resource planning

MODELS

Modernization of Defense Logistics Standard Systems

NARA

National Archives and Records Administration

NIST

National Institute of Standards and Technology

NTE

Note Identifier

OPN

Operational Pilot Network

PC

personal computer

PDES

product data exchange specification

PDSO

Packet Data Security Overlay

PEM

Privacy Enhanced Mail

PKC

Public Key Cryptography

PLUS

Protection of Logistics Unclassified/Sensitive Systems

PUB

Publication

QAR

Quality Assurance Report

RFP

Request for Proposals

RFQ

Request for Quotations

R&M

reliability and maintainability

RSA

Rivest-Shamir-Adleman

SMTP

Simple Mail Transfer Protocol

SNA

System Network Architecture

TCP

Transmission Control Protocol

TCP-IP

Transmission Control Protocol-Internet Protocol

TIPEM

Toolkit for Internet Privacy Enhanced Mail

TIS

Trusted Information Systems

TM

Trusted Mail

TPA

Trading Partner Agreement

UN/EDIFACT

EDIFACT; Electronic Data Interchange for Administration, Commerce, and Transport

USAF

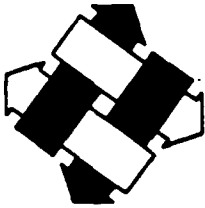
United States Air Force

WORM

Write Once Read Many

9.0 FORMS AND DOCUMENTS

This chapter contains selected excerpts from the *Fall 1990 Information Manual* and the *Spring 1991 Information Manual*. The excerpted material is used with permission of the Data Interchange Standards Association, Inc. In this chapter, we first present the applicable ASC X12 forms. The initial section, *Introduction*, gives the background of ANSI, ASC X12, and the Data Interchange Standards Association. Following that, we present the *ASC X12 Organization*, the *ASC X12 Standards Process*, and finally, the *Standards Background*.



VIII - FORMS, FORMS, FORMS

ASC X12 Work Request Form

ASC X12 New Project Proposal Form

ASC X12 New Transaction Set Development Form

Form for New or Revised Appendix A Code Source Reference

Document Preparation for Interpretations, Guidelines and Control Standards

Sample Transmittal Form

ASC X12 Ballot Comment Response Letter Format

ASC X12 Standards Order Form

X12/DISA INFORMATION MANUAL

Rev. 5/10/90

DATE SUBMITTED _____

DM NUMBER _____

(Secretariat Only)

ASC X12

WORK REQUEST FORM

ALL REQUESTS MUST BE TYPED or printed legibly in black ink. Complete both sides.

1. TO USE THIS FORM FOR SUPPORTING DATA MAINTENANCE FOR A NEW DRAFT STANDARD OR X12 INTERPRETATION, list all requirement on ONE form. Use attachments as necessary. List first all new segments, then all new data elements/codes/code sources. Then list revisions to existing segments and data elements/codes/code sources. Then list any others (e.g., X12.5, X12.6).
2. TO USE THIS FORM TO REQUEST A CHANGE TO AN EXISTING STANDARD, use a separate Work Request Form to list all changes for one transaction set, one segment, one control structure, or one data element. All sections must be completed. Attachments may be used for continuation and should be numbered.
3. TO USE THIS FORM TO REQUEST A PROPOSED NEW X12 PROJECT, complete Section A. Provide a purpose/scope and describe any new features involved in Section B. Provide a description of the business need and justification for the new project in Section C/Part II. The Work Request will be forwarded to an appropriate X12 subcommittee for analysis and preparation of a project proposal.

Circle One: (1) New Standard Supporting Data Maintenance (use attachments)
(2) Existing Standard Maintenance Request (see Section D)
(3) Request for New X12 Project

Acronyms/abbreviations cannot be added to the standards. Industry-specific terms must be clearly explained. Provide Appendix A code source references for all externally published code lists cited. Incomplete forms or those with inadequate support for the change requested will be returned to the submitter.

A. SUBMITTER INFORMATION

Submitter: Name _____
Company _____
Address _____
Address/ZIP _____
Phone _____

Indicate the X12 subcommittee or task group whose position is represented here.

I declare that this represents the official position of X12 WORK GROUP: _____
established at the meeting dated _____.

B. PROPOSED WORK: List the specific changes to the standards being requested. Give the names and associated identifiers of the standards, segments, data elements and codes affected.

Page Two

C. REASON FOR CHANGE:

Part I: List the version/release of the standard you are using or using as a reference. Name the transaction set that is being/will be used that dictates the requested change. List affected segments and data elements, or other standards. Provide only reference numbers/IDs.

Reference Source Version 2/Release _____
Transaction Set Used _____
Segment Affected _____
Data Element Affected _____
Other Standard _____

Part II: Explain why you need the proposed change. Provide a complete scenario that tells what the business function, operation, or problem is that will be satisfied by a change to the standard. The X12J Technical Assessment Subcommittee requires enough information in this Part II to be able to propose an alternate solution if necessary.

D. RAMIFICATIONS: If you circled (2) on Page 1, complete this section. To ensure that all ramifications of your proposed change are recorded and that your request is complete, circle below all sections of the standards affected by the proposed change.

TRANSACTION SET	Name	Purpose/Scope	Table Note/Comment
	Segment Position	Require. Des.	Max. Use
	Loop Repeat	Loop Structure	Add Segment
	Delete Segment		

SEGMENT	Identifier	Name	Definition
	Add DE	Delete DE	Position in Segment
	Require. Des.	Syntax Note	Semantic Note
	Comment		

DATA ELEMENT	Name	Description	Type
	Min/Max		

CODE	Add code	Delete Code	Revise Code

OTHER (e.g., X12.5, X12.6):

ERRORS NOTED IN THE STANDARD (Give page no. and other identification):

PP No. _____
(Secretariat Only)

ASC X12
NEW PROJECT PROPOSAL FORM

PROCEDURE: Only X12 subcommittees may use this form to register new development activities as X12 project proposals (PPs). Complete all pages. PPs approved by the X12 Procedures Review Board will be registered and assigned a PP number by DISA, and a Transmittal Form will be issued.

Date and complete the form below. Type or print legibly in black ink and number all attachment pages consecutively. Submit to DISA prior to an ASC X12 meeting, or to X12J Technical Assessment Subcommittee during the subcommittee's agenda period at an ASC X12 meeting.

Date Submitted:

Date Approved by Subcommittee:

Subcommittee Name:

Task Group Name/No.:

Joint Development Subcommittee (if any):

Circle one: (a) Transaction Set (b) Guideline (c) Other

Project Working Title:

Official Delegate(s) for This Project To Be Named on Transmittal Form:

Name _____ **Name** _____

Company _____ **Company** _____

Address _____ **Address** _____

Address/ZIP _____ **Address/ZIP** _____

Telephone _____ **Telephone** _____

A. PURPOSE AND SCOPE FOR THE PROPOSED WORK: Provide a well-defined purpose/scope for the proposed work. See X12 Design Rules and Guidelines for requirements.

B. BACKGROUND: Provide details that will be helpful in reviewing the proposal. Who are the expected users? How will the standard be used? What business function(s) does it serve?. If the proposed standard overlaps the functionality of an existing standard or one in development, provide justification. If the proposal is not for a new standard or guideline, describe the project in detail. (Use attachments if necessary.)

C. OTHER STANDARDS INVOLVED: If applicable, identify any other business information standards that are similar/related to the proposal, and name standards developers (e.g., ANSI Accredited Standards Committees) whose activities may be involved or affected.

D. EXPECTED CONTENT/GENERAL DESCRIPTION: (OPTIONAL) Submitter may attach a preliminary draft of the proposed standard or other supporting documentation. Discuss new segments, data elements, control structures, and changes to X12.5 or X12.6 that are required or anticipated. (Use attachments.)

4/1/90

FORM FOR NEW OR REVISED APPENDIX A CODE SOURCE REFERENCE

INSTRUCTIONS: Complete this form whenever a new data element or data element code is requested to be added which references a code list published by an external (non-X12) organization. Use one form for each new reference. This form may be used to revise current references; fill out the appropriate areas below.

CIRCLE ONE, COMPLETE AS APPROPRIATE:

(1) NEW REFERENCE

(2) REVISED REFERENCE, Current reference number/name _____

REFERENCE TITLE: If there is only one source for codes for the data element, the title should be the same as the data element name. If there are multiple codes referencing external code sources for the same data element, title should approximate the code definition.

REFERENCE TITLE: _____

DATA ELEMENTS USED IN: Give the data element reference number and name which directs the user to this Appendix A code source reference. Give the code ID (if assigned) if this is for a specific code of the data element.

USED IN: DE No. _____, Code ID _____

SOURCE: Provide the name of the publication which contains the codes referenced.

PUBLISHED IN: _____

AVAILABLE FROM: Give the publisher, or other contact, from whom the user can obtain the document.

Name/Attn of _____

Company _____

Address _____

Address _____

Address/ZIP _____

ABSTRACT: Briefly describe the publication, its purpose, and indicate what codes it contains.

ABSTRACT: _____

DOCUMENT PREPARATION FOR INTERPRETATIONS, GUIDELINES AND CONTROL STANDARDS

These instructions are provided to assist developers of interpretations, guidelines and control structure which are not transaction sets (for transaction sets use the New Transaction Set Development Form).

GENERAL: DISA provides title page and front matter for publications and copyedits the document according to DISA house style.

REVISIONS: If the document is a revision of a previously published interpretation, guideline or standard, provide a summary of the changes to the original that are contained in the document.

I INTERPRETATIONS

A formal interpretation of an X12TM Standard is considered part of the body of standards when it is approved for publication. The interpretation draft should state the issue presented by the requestor, state the proposed interpretation, and show as attachments any Work Requests that may be necessary to effect the interpretation within the subject standard. The draft interpretation is processed like any other subcommittee document.

II GUIDELINES

For publication purposes, guidelines are treated like a journal article. Basic requirements are given below.

ABSTRACT: This is a precise summary of the Purpose/Scope (see below), and may be identical to it if that is brief (two paragraphs); otherwise summarize the purpose/scope. It should contain enough information about the document to enable a reader determine what the guideline is intended to accomplish within an EDI environment.

PURPOSE AND SCOPE: This statement must indicate purpose of the guideline, e.g., the business function or operation addressed. Scope and any specific limitations of scope should be defined.

BODY OF TEXT: This may be a number of subsections logically organized. Provide sections for foreword, introduction, definition of terms and concepts, references and related standards, methodology, specifications, requirements, discussion, and conclusions, as appropriate to the subject.

ART AND GRAPHICS: Graphics or artwork necessary to illustrate the document are encouraged. Provide camera-ready copy if these are not already prepared and delivered on a WP diskette to DISA.

FOREWORD, FOOTNOTES, APPENDICES: These may be used for purposes of clarity, illustration, or general information, not as "part of the guideline." A statement indicating the material is for information purposes only and not part of the guideline shall appear at the beginning of a foreword or appendix.

III CONTROL STRUCTURES AND OTHER STANDARDS

For publication purposes, these documents are treated like guidelines (see Section II above). The requirements are the same, with the addition of the following:

NEW SEGMENTS AND DATA ELEMENTS: These may be defined within the text; however, since they represent changes to X12.22 and X12.3, they should be specified on a Work Request Form attached to the draft.

RELATED X12TM STANDARDS AND OTHER REFERENCES: These shall be identified in a section within the text.

Page Two

FORMAT: "This Draft Standard for Trial Use contains the format and establishes the data contents of the _____ Transaction Set (____) for use within the context of an Electronic Data Interchange (EDI) environment. The transaction set (can be used to...)"

C. PURPOSE AND SCOPE This statement must indicate the full range of capabilities of the transaction set, and who the senders/receivers are. Explain the business function or operation that is addressed. Follow ASC X12 Design Rules and Guidelines and use this format:

FORMAT: "This standard provides the format and establishes the data contents of the _____ Transaction Set within the context of an Electronic Data Interchange (EDI) environment. This transaction set (can be used to...)"

D. TRANSACTION SET TABLE(S) For each table provide the following information. FORMAT:

TABLE X

POSITION NO.	SEGMENT ID	TITLE	REQ. DES.	MAX. USE.	LOOP COUNT	REPEAT	NOTE REF.
010	ST	Transaction Set Header	M	1			Note 1
020	BB	Beginning Segment For	M	1			Comment 1
etc.							

Note 1: This is a note. NOTES are part of the standard (numbered).

Comment A: This is a comment. COMMENTS are not part of the standard (lettered).

E. APPENDIX EXAMPLES Examples are used to test the merit of the proposed transaction and to explain it to users. At least one example is mandatory. No recognizable proper names may be used in any example.

FIGURE 1: (Optional) Use a sample paper document using mock data. If used, data must be accurately mapped to Figure 2. Original graphics must be attached (8-1/2x11") so they can be copied.

FIGURE 2 (or EXAMPLE): Title the figure and provide a Business Scenario to explain to the reader what is going on in the example. Add the note: "In this example the asterisk (*) represents the data element separator and the N/L characters represent the segment terminator." Present EDI transmission data and its meaning in two columns, side-by-side. ZZ or ZZZ codes are discouraged, since their usefulness in an explanatory example is nil. FORMAT:

BUSINESS SCENARIO: In this transaction set the sender is XYZ Retail Center and the receiver is their supplier, Fantastic Products Manufacturing, Inc....etc.

EDI TRANSMISSION DATA

(TRANSACTION SET PURPOSE) DATA

ST*8XX*0005 N/L
No. 0005
BB*01*79800* N/L
79800
etc.

Begin Transaction Set 8XX; Control
Original Transmission; Ref. No.

DM Number _____
(Secretariat Only)

Document No. _____
(Developer Obtains from DISA)

ASC X12 NEW TRANSACTION SET DEVELOPMENT FORM

INSTRUCTIONS: Use this form to submit a draft transaction set for review by X12J Technical Assessment until it is text processed by DISA. Use a new Transaction Set Development Form whenever revisions are proposed and a text file has not yet been prepared by DISA.

ATTACHMENTS: Attach all pages; use this form as the first. Follow these instructions for preparing materials.

The submitter must obtain a document number assignment from DISA. Post it to this form (above).

Attach a List of Revisions if the draft was previously reviewed by X12J or if this is a revised/redesigned transaction set standard requiring X12 ballot.

Use ONE Work Request Form to list all supporting data maintenance for the transaction set and attach it to this form. Propose new or revised codes for DE 143 and DE 479 at a minimum, if required.

A Transmittal Form must accompany this document when it is submitted to DISA for distribution.

Use the most recent X12TM Standards Development Workbook to check your document for accuracy.

A. SUBMITTER INFORMATION

Submitter: Name _____
Company _____
Address _____
Address/ZIP _____
Phone _____

Indicate the X12 subcommittee or task group whose position is represented here.

I declare that this represents the official position of X12 WORK GROUP: _____
established at the meeting dated _____.

B. ABSTRACT The Abstract is registered with the American National Standards Institute. It is a precise summary of the Purpose/Scope (see Section C below). It may be identical to the Purpose/Scope if that is brief (two paragraphs), otherwise summarize the purpose/scope. It should contain enough information about the standard to enable a potential user determine what equivalent paper transaction it represents or what the standard is intended to do. Follow the format on page two.

SAMPLE TRANSMITTAL FORM

initialized

KEY DATE: February 15, 1990

DELEGATE'S NAME
RESPONSIBLE SUBCOMMITTEE/TG#

John Doe
ASC X12Q XX Subcommittee/TG4

TRANSACTION SET/GUIDELINE TITLE

X12.XX ABC/XYZ TRANSACTION SET (8XX)

BALLOT Document No.
Current Document No.
Previous Document No.
Project Proposal No.
Associated WR/DM No.

ASC X12Q/90-051
ASC X12Q/90-004
PP-999
DM 012-190

PROJECT PROPOSAL

PP Review by X12J

(DATE) 2/7/90

PRB Approves PP

(DATE) 2/9/90

DEVELOPMENT PHASE: Project proposal approval through approval for X12 vote.

Document Submitted for DISA Text Processing
Subcommittee Approves Draft for Review by X12J, Tech Assessment
X12J Tech Assessment Review
PRB Approves Document for X12 Vote

(DATE) _____
(DATE) _____
(DATE) _____
(DATE) _____

ORIGINAL BALLOT DATA (DISA):

Ballot Closed Date
Tally/Comments Sent to Chair/Delegates
Tally Stats (Number and Percent)
_____ Ballots Mailed (100%)
_____ Ballots Returned (____%)
_____ Approved (____%)
_____ App w/Comment (____%)
_____ Disapproved (____%)
_____ Abstained (____%)

(DATE) _____
(DATE) _____

Page Two

COMMENT RESOLUTION PHASE: See Sections A, B and C. If the subcommittee at any time decides to reballot the document, PRB approval is required and response letters are not necessary.

A. COMMENT RESPONSE LETTERS: An Open Forum must be scheduled at the next X12 meeting following the ballot closing date. All those who commented receive a comment response letter from the developing subcommittee. DISA records this process and handles the mailing.

Open Forum Date (DATE) _____
Response Letters Mailed Out by DISA (DATE) _____
Rebuttal Period (30 days) Closes (DATE) _____

ADJUSTED BALLOT DATA (DISA):

30-Day Response Review Closed Date (DATE) _____
Tally/Comments Sent to Chair/Delegates (DATE) _____

Tally Stats (Number and Percent)

_____ Ballots Mailed (100%)
_____ Ballots Returned (____%)
_____ Approved (____%)
_____ App w/Comment (____%)
_____ Disapproved (____%)
_____ Abstained (____%)

B. SUBSTANTIVE REVISION: If ballot comments result in substantive revisions to the document, these are reviewed by X12J and processed by DISA. The revised document is submitted to X12 voters for a 30-day review period. DISA records this process/handles mailing. Subcommittees should conduct 30-day reviews for response letters/revised documents concurrently.

Subcommittee Approval of Revisions (DATE) _____
X12J Review of Revisions (DATE) _____
DISA Mails Revised Document (DATE) _____
Substantive Revision 30-Day Review Closes (DATE) _____

ADJUSTED BALLOT DATA (DISA):

30-Day Substantive Change Review Closed Date (DATE) _____
Tally/Comments Sent to Chair/Delegates (DATE) _____

Tally Stats (Number and Percent)

_____ Ballots Mailed (100%)
_____ Ballots Returned (____%)
_____ Approved (____%)
_____ App w/Comment (____%)
_____ Disapproved (____%)
_____ Abstained (____%)

Page Three

C. CONTINUING OBJECTIONS. If there are continuing disapprovals after the 30-day review period, the document/disapprovals/responses/continuing objections are mailed to X12 members who originally cast a ballot, for another 30-day review, to give them an opportunity to change their vote.

Continuing Objections Mailed to Chair/Delegate by DISA
DISA Mails Documents
30-Day Review Closes

(DATE) _____
(DATE) _____
(DATE) _____

FINAL ADJUSTED TALLY (DISA): Whenever any disapprovals are withdrawn, a letter to this effect must be received in writing by DISA.

Final Tally Results Sent to Chair/Delegate
30-Day Review Stats (Adjusted Tally)

(DATE) _____

_____ Ballots Mailed (100%)
_____ Ballots Returned (____%)
_____ Approved (____%)
_____ App w/Comment (____%)
_____ Disapproved (____%)
_____ Abstained (____%)

PRB APPROVAL PHASE: After the comment resolution period, the subcommittee votes to submit the document to the PRB for approval to publish.

Subcommittee Votes to Release to PRB
PRB Approves Publication

(DATE) _____
(DATE) _____

FOR DRAFT STANDARDS FOR TRIAL USE:
VERSION/RELEASE/SUBRELEASE ID CODE ASSIGNED: _____

Page Four

TRANSMITTAL FORM INSTRUCTIONS:

GENERAL: This Transmittal Form is a TURNAROUND DOCUMENT which records the history/current status of a project document. It is used to exchange information between the Secretariat and the committees of X12. Information is cumulative (add on). This form is attached to the document whenever it is issued for distribution (it is mandatory for submitting documents to DISA, X12J Technical Assessment, and the PRB). Document control numbers are still required on each document, and new numbers are required whenever it is revised.

KEY DATE: This is used to identify the latest version of the document (date associated with the current transmittal form update).

DELEGATE: Each subcommittee designates an individual (delegate) from the group responsible for the project. The Secretariat must be informed if the delegate changes.

INITIATION: Primary data is recorded by DISA on the initialized form after the project proposal is approved by the PRB. The subcommittee chair and delegate(s) receive the initialized Transmittal Form from DISA; thereafter, they are responsible for recording the appropriate subcommittee approval dates. The chair/delegate will receive a copy of the updated transmittal form whenever it is revised by DISA.

UPDATING: At each appropriate step, DISA will POST fresh data to the form, ADD the next appropriate blanks to the form, and SEND it to the subcommittee chair/delegate at each status change. The delegate must POST the form with fresh data at each status change for which the subcommittee is responsible and SEND it with the appropriate document to the Secretariat.

01/88

ASC X12 BALLOT COMMENT RESPONSE LETTER FORMAT

GENERAL INFORMATION

AFTER AN X12 BALLOT, THE RESPONSIBLE SUBCOMMITTEE (OR ITS DESIGNATED TASK GROUP) MUST respond in writing to all disapproval votes. The Organization & Procedures manual (OPM) states that you are not required to respond to those members who approved with comment, but typically all commentors are responded to. The OPM states that all comment responses must be coordinated with the Subcommittee Chair.

There are two response letter formats from which to choose: a generic letter which will be sent to all commentors, and a individualized response to each commentor. See instructions below and the attachments.

OPTION 1: GENERIC LETTER (MASTER LETTER) TO ALL COMMENTORS

You may prepare one letter to be sent to all commentors. Every comment received must be reproduced in your letter. For each comment listed, name the commentor (X12 member company name) and the vote recorded for them. Link your response to the comment. If you choose this option, you may group the comments which are similar and respond to them as a group. Every member that disapproved must be responded to.

OPTION 2: INDIVIDUAL LETTER TO EACH COMMENTOR

You may prepare one letter for each commentor. If you choose this option, you need not repeat the original comment provided on the ballot. Follow the usual business letter style and the general instructions below. Every member that disapproved must be responded to.

INSTRUCTIONS

STEP 1: Plan to print the first page of your letter(s) on ASC X12 letterhead. If you don't have letterhead, you can obtain some from the Secretariat or reproduce the sample attached. You may not use personal, corporate, or blank letterhead for your comment response letter(s).

STEP 2: Call the Secretariat for a document control number. This number must appear in the upper right corner of the first page of the letter. If you send an individualized letter to each commentor, the document control number assigned for the first letter will be followed by an "A" (e.g., ASC X12F/TG9/90-120A), the second by a "B" (e.g., ASC X12F/TG9/90-120B), etc.

STEP 3: Choose your letter format option (see General Information above).

STEP 4: Prepare the letter following the outline, below using a typical business letter format.

- a. Provide a contact name (sender's) in the upper right corner box of the letterhead; include phone number.
- b. Print the document control number under the letterhead box.
- c. Print the date under the document control number.
- d. Address the letter to the individual, or for a generic letter include an addressee line and subject line.
- e. Include an introductory paragraph so the issue is properly identified to the addressee.
- f. You may wish to recap the ballot tally (from your Transmittal Form) for the information of the reader.

STEP 4: Forward the letters to the Secretariat, Attention Secretariat Services, with a cover letter requesting distribution of the response letter(s) you have prepared. When the letters have been distributed, the project delegate and subcommittee chair will receive an updated Transmittal Form which has the mailing date and 30-day review period closing date posted.

Attachments: X12 Letterhead Sample
 Sample Master Response Letter
 Sample Individual Letter

ASC X12-ELECTRONIC DATA INTERCHANGE (EDI)

Accredited Standards Committee
operating under the procedures of the
American National Standards Institute

Tim Jonesey
(999) 999-9999

Dan Smithey
(999) 999-9999

Document No

ASC X12C/TG20/90-999
June 25, 1990

TO: X12 Members Who Commented on Modifications to
X12xx Control Structures

RE: Response to Comments on December Ballot
DMs 205289, 215289, 317289

Thank you for your comments. This ballot involved modifications to X12xx. Of the 327 ballots mailed, 153 ballots were returned. Of these, 81 approved, 15 approved with comment, 20 disapproved with comment and 37 abstained.

In general, the vote responses were in favor of the modifications. The majority of the comments focused on the impact of these modifications on the presentation of information in the X12.22 Segment Directory. The proposed modifications and the resulting presentation in the segment directory have been reworked in response to these comments. A revised modification to X12xx was reviewed by Technical Assessment at the June ASC X12 meeting. Modifications to the document have been made which reflect responses to the comments from this ballot, and a revised copy of X12xx is being distributed to all who voted on this issue, for 30-day review of revisions.

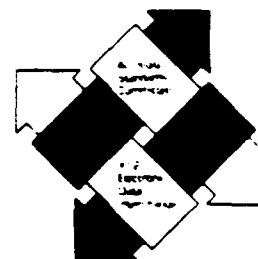
Specific responses to comments follow.

COMMENT: Automobile Corporation

"Add the following note to Paragraph 3.3: NOTE: Communication protocol characters should be excluded from the character set."

RESPONSE:

The cover letter sent out with the voting package explained that the intent was to obtain consensus on the proposed modifications to X12xx. X12xx is a difficult standard to amend. We request that ballot responses be considered on the merits of the recommended modifications and not on the standard as a whole. Your comment was outside the scope of the requested modifications.



Page Two

COMMENT: Aircraft Engine Corporation

"Some consideration for Abstract Syntax Notation One (ASN.1) should be allowed.

1. ASN.1 is capable of defining all of the necessary inter-relations needed by X12 transactions.
2. ASN.1 requires less characters to define the same information.
3. ASN.1 is the encoding scheme used by most OSI work."

RESPONSE:

The recommendation to consider usage of ASN.1 encoding reaches far beyond the scope of the modifications requested in this ballot. Activities such as this are best submitted as separate work requests.

COMMENT: Some Software Inc.

"Conditionality of data elements should be left to the discretion of implementation guidelines and agreements. There is much discussion at times as far as whether certain data elements should be mandatory or not; many application systems are incapable of providing certain 'mandatory' information and, as such, filler-type data must be inserted."

RESPONSE:

The issue of data element conditionality as a whole is a much broader subject than was intended to be addressed within the scope of this ballot. This ballot was intended to provide a means for consistent documentation and application of already existing conditional structures. If the commentor believes that the conditional structure should be removed from the standard, the task group recommends that this be submitted as a separate work request.

Etc.

ASC X12-ELECTRONIC DATA INTERCHANGE (EDI)

Accredited Standards Committee
operating under the procedures of the
American National Standards Institute

Joe Somebody
Chair TG19, X12C
(999) 999-9999

Document No

ASC X12C/TG8/90-998A
August 10, 1990

Ms. Jane Doe
American Bank
One Central Plaza
Middle America, MO 99999

RE: Response to Ballot Comments on
ASC X12 Model Guideline

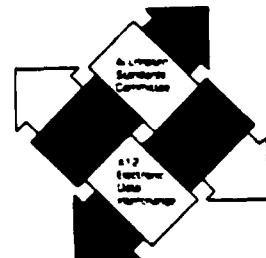
Dear Ms. Doe:

Subcommittee X12C has empowered its Task Group 19 to provide responses to the comments on this ballot. The members of TG19 wish to thank all X12 members who took the time and effort to vote on this guideline. We especially thank each individual who provided comments, whether in approval or disapproval of the guideline. We recognize and appreciate your careful review of this document.

Our response is keyed to the numbered items in the comments attached to your ballot.

RESPONSE

1. We agree with your comment. In Section 4.2.2, we have replaced "we utilize rules ..." with "rules ... are utilized".
2. The confusion between Section 4.2.3 and Section 6.2 only exists because of the example we chose in the first section. This is a hypothetical example, of a simplified model. Headers and trailers can be placed on the content at ALL levels, and do not necessarily correspond to ASC X12 headers and trailers.
3. We agree with your comment. Section 6.2 has been changed so that "the establishment of ..." was added to items 1 and 4.



*General information
on ANSI, X12 and
DISA is given.*

INTRODUCTION

ANSI

The American National Standards Institute (ANSI) was founded in 1918 as the national coordinator of the voluntary standards system for the United States. The system meets national standards needs by marshaling the competence and cooperation of commerce and industry, standards developing organizations, and public and consumer interests. ANSI coordinates the voluntary development of national consensus standards, approves standards as American National Standards, and serves as a clearinghouse and information center for American National Standards and international standards.

ANSI itself does not develop standards. It approves a standard only when it has verified evidence presented by a standards developer that those affected by the standard have reached substantial agreement (consensus) on its provisions. ANSI-approved standards, including X12 EDI standards, currently number over 8,500. They provide requirements, terminology, tests for everything imaginable...beveled washers...safe use of lasers...kitchen cabinets...computer software...building accessibility for handicapped people. They have one main characteristic in common: they can be used with confidence because, in each case, ANSI has verified evidence that those directly affected reached substantial agreement—consensus—on the standards' provisions.

Consensus is the heart of the ANSI system. Democracy prevails. ANSI provides an open forum for all concerned interests to identify standards needs, to plan to meet those needs, and to agree on standards.

ASC X12

In 1979 ANSI chartered the Accredited Standards Committee (ASC) X12 to develop uniform standards for inter-industry electronic interchange of business transactions.

The main objective of the ASC X12 Committee is to develop standards to facilitate electronic interchange relating to such business transactions as order placement and processing, shipping and receiving information, invoicing, and payment and cash application data.

In ASC X12, various subcommittees develop new standards that become recommendations for the full X12 membership. Proposed standards must be approved through the consensus process before a standard (or any change to a standard) is approved and registered with ANSI.

DISA

The Data Interchange Standards Association, Inc. (DISA) was formed in 1987 to be the Secretariat and administrative arm of ASC X12. DISA is a not-for-profit corporation, and its staff manages X12 membership, balloting, international programs, standards maintenance, publications, the annual conference and exhibit, X12 meetings, communications with ANSI on behalf of ASC X12, and other administrative duties required to support the X12 Committee.

ASC X12 ORGANIZATION

This section discusses the ASC X12 organization.

ASC X12 Membership

X12 is an Accredited Standards Committee operating under the procedures of the American National Standards Institute. Its membership is open to any individual, company or organization which may be directly and materially affected by X12 activities. Annual dues payment is required for membership (see Section VII for a Membership Form).

Membership has grown dramatically (from fewer than 100 to over 300 in a two-year period) and stands at over 460 today. Benefits include an opportunity to vote on every issue before the X12 Committee, price discounts on standards publications, reduced attendance fees at the annual conference, free X12 meeting registration, and continual information updates on committee activities and standards.

Secretariat

The Data Interchange Standards Association, Inc. (DISA) is a not-for-profit corporation which was formed in 1987 to be the ASC X12 Secretariat and administrative arm of the committee. DISA also serves as the Secretariat for the North American EDIFACT Board (NAEB), whose activities are aimed primarily at the development and maintenance of the international EDI standards.

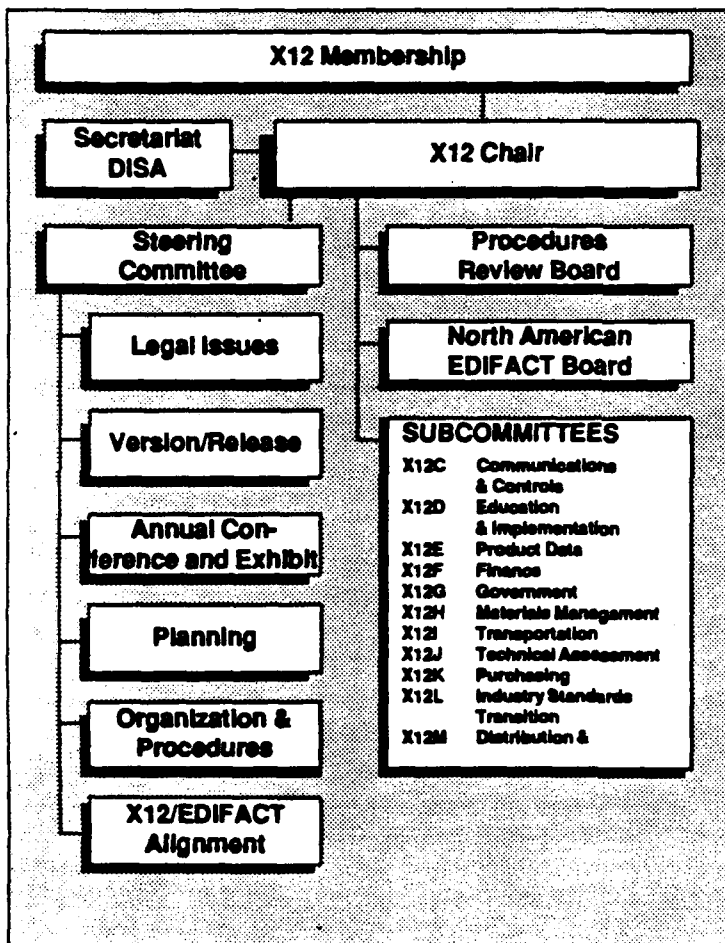
ASC X12 Chair and Vice Chair

The ASC X12 Chair and Vice Chair are elected by majority vote of the X12 members to serve a two-year term of office. Elected at the October, 1989 meeting are the

current Chair, Ken Hutcheson (Du Pont Company), and Vice-Chair, Jim Sykes (Levi Strauss & Company). Their terms of office expire in October 1991.

Steering Committee

The ASC X12 Steering Committee develops recommendations for the administration of X12 in close coordination with the Secretariat. The Steering Committee is composed of the X12 Committee Chair, Vice Chair, Subcommittee Chairs, and past officers. Non-voting members include a Secretariat



representative, Steering Committee Task Group Chairs and a recording secretary.

The Steering Committee has several standing task groups:

- Annual Conference Task Group coordinates the X12/DISA Conference and Exhibit.
- Legal and Business Control Issues Task Group provides information and performs studies on legal issues surrounding the use of EDI.
- Version/Release Task Group is responsible for the form and format of ASC X12 Draft Standards for Trial Use, and X12 American National Standards.
- Planning Task Group is responsible for long-term and short-term planning for ASC X12 in the areas of technical issues, public relations and finance.
- X12/EDIFACT Alignment Task Group is charged with formulating recommendations for achieving one set of global EDI standards.

Procedures Review Board

The Procedures Review Board has primary responsibility to ensure that due process is followed before approval of new project proposals, release of documents for X12 Committee ballot, and publication of standards.

North American EDIFACT Board

The North American EDIFACT Board (NAEB) is an X12 Committee Standing Task Group. This group serves as the forum for development of the North American position on international EDI message standards and related issues. EDIFACT standards development, maintenance and technical assessment in North America occur within the national standards bodies of the United States (ASC X12) and Canada (Standards Council of Canada Joint Technical Committee on EDI).

ASC X12 Subcommittees

The X12 Committee is the decision-making body responsible for developing the evidence of consensus necessary for approval of American National Standards. Subcommittees are assigned responsibility for specific standards development and standards maintenance activities, but their work must be ratified by the membership of ASC X12.

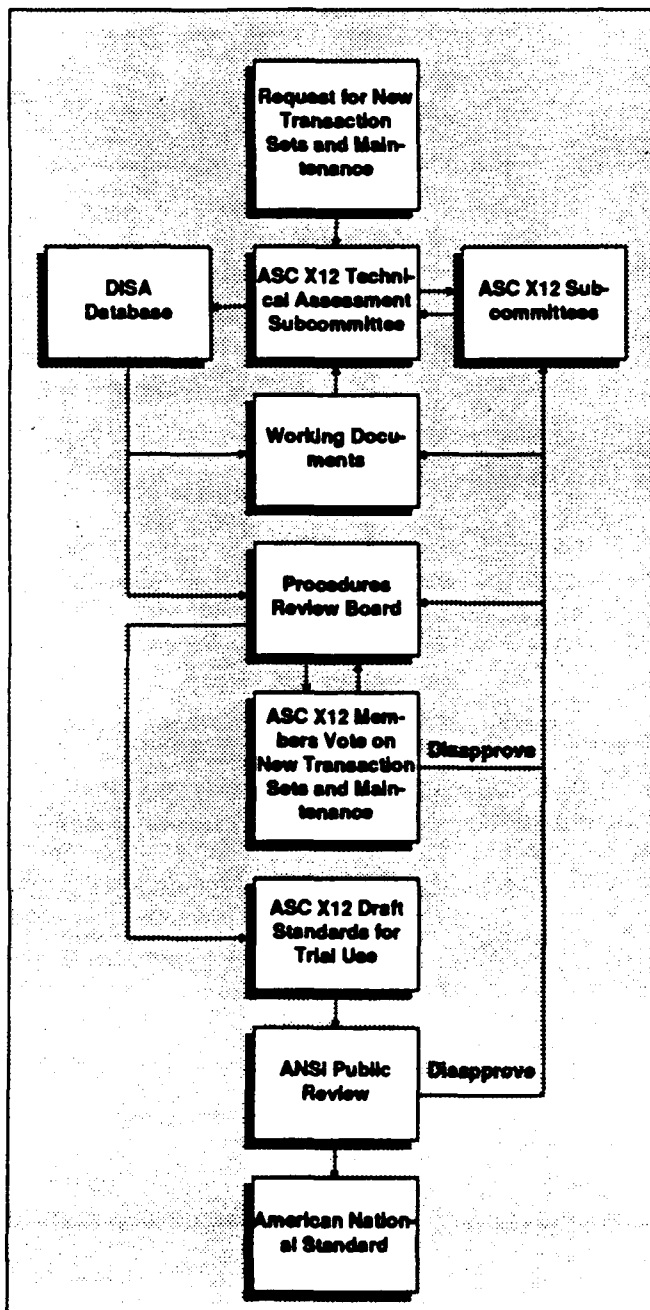
X12/DISA INFORMATION MANUAL

THE ASC X12 STANDARDS PROCESS

The following is a
precis of ASC X12
standards
development and
maintenance
procedures.

Organization & Procedures Manual

The ASC X12 Organization & Procedures Manual (OPM) is the official source for information on standards processing requirements. The following material has been excerpted from that document to give you an idea of the process, and as a reference source.



Processing Draft Standards for Trial Use

General

To maintain its accredited committee status, ASC X12 must follow these procedures to ensure compliance with the ANSI Procedures for the Development and Coordination of American National Standards.

VOTING. These voting procedures apply to X12 and subcommittee votes. For a letter ballot the voting positions are: (1) approve, (2) approve with comment, (3) disapprove with reasons, (4) abstain. A member not voting is designating no interest in the matter subject to the vote. The letter ballot voting period shall be 45 days from the mailing date unless otherwise designated in these procedures. Voting at a meeting may occur if the technical comments can be addressed through discussion or amendments.

For a letter ballot, 20% of the ballots mailed, including abstentions, must be returned or the issue is unresolved. Unless otherwise specified, a favorable vote by X12 or any subcommittee means two-thirds approval vote by the voting members present at a meeting or by two-thirds approval of the ballots returned for a letter ballot; no interest and abstentions are not counted.

Planning Phase

The first phase covers the examination of a proposal that X12 undertake development of a new standard or revision of a published standard.

WORK REQUEST. A work request may be developed by any individual or organization

whether or not associated with ASC X12. The work request is sent to the Secretariat for processing. This work request is then reviewed by the Technical Assessment Subcommittee (TAS) which may refer the work request to one or more developing subcommittees. This work request may result in other action, including maintenance to an existing standard.

PROJECT PROPOSAL. The developing subcommittee reviews the work request and prepares and approves a formal project proposal when it determines that a new standard should be developed. A subcommittee may prepare a project proposal without first submitting a work request; the proposal must be sent to the Secretariat.

PROJECT PROPOSAL APPROVAL. The project proposal is referred to the TAS for recommendation. TAS reviews it and makes a recommendation to the PRB to approve or disapprove. The PRB will decide by vote whether to approve the project proposal and will assign development responsibility to a subcommittee. In the case of joint development, it assigns primary responsibility to one subcommittee and identifies the other groups involved. It is the PRB's responsibility to determine whether the proposed work is within the scope of X12 and is consistent with other standards of X12 and the rules for development of standards.

Development Phase

The proposed standard is drafted by a developing subgroup, which may be a subcommittee or task group. If there is more than one subcommittee involved, the one with primary responsibility will coordinate with the others. The developing subgroup may request involvement by other subgroups or other standards groups. The subgroup decides whether to solicit input from international bodies or foreign liaisons. All other known X12 or International Standards Organization (ISO) activities whose projects could be affected by this project should be consulted. Contributions from any source are accepted and considered.

DEVELOPMENT AND APPROVAL. The assigned subcommittee shall be responsible for developing the project proposal into a proposed Draft Standard for Trial Use (DSTU). The subcommittee shall vote to release the proposed DSTU for the next review and approval steps. In the case of joint development, the primary subcommittee shall ensure that all subcommittees involved approve the proposed DSTU before it is released for further processing.

TAS REVIEW. A final review of the proposed DSTU is conducted by TAS. This consists primarily of a review for technical soundness and appropriate purpose and scope.

PRB REVIEW. The PRB reviews the draft and the development process to ensure that procedures and due process were followed. This review may involve resolution of disagreements between subcommittees. The positions of the subcommittees that are party to a disagreement shall be prepared in writing. PRB approval by two-thirds of the voting members present is required for release of the document for X12 vote.

ASC X12 Review and Approval Phase

This phase involves the formal review required within X12 to ensure that X12 members have the opportunity to review and comment on the proposed DSTU.

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X12 VOTE. X12 vote on the proposed DSTU shall be conducted as specified. If the issue does not receive a two-thirds favorable vote before comment resolution, the issue fails and is referred to the responsible subcommittee.

If after X12 vote there are no unresolved disapprovals and no substantive change to the proposed DSTU, the Secretariat is so notified in writing by the subcommittee chair. The results of X12 votes are announced at the next X12 meeting and recorded in the minutes of the meeting.

RESOLUTION OF DISAPPROVALS. The Secretariat forwards the vote tally and any comments accompanying the ballots to the developing subcommittee chair and the developing subgroup. The developing subgroup provides an open forum at the next meeting to consider each disapproval and prepares a response to each. This review may result in the withdrawal of any objection. Comments other than disapprovals are considered, but responses do not have to be prepared. The subgroup coordinates with the subcommittee chair for the response. The response is sent to the Secretariat who logs it and forwards it to the commentor with a notice that there is a 30-day rebuttal period.

SUBSTANTIVE CHANGES. Review of the comments may result in changes to the proposed DSTU; approval of these revisions requires vote by the responsible subcommittee. If there is substantive change to the proposed DSTU, the subcommittee instructs the Secretariat to send the revised document to TAS for review. After TAS reviews the revised text, it is sent for a 30-day review to the X12 members who originally returned a ballot, to give them an opportunity to change their original votes.

If the review produces additional comments or disapprovals, these become part of the record and the final vote count, but the subgroup does not need to prepare responses. The subcommittee determines whether the proposed DSTU is ready to be reviewed by the PRB. The Secretariat is so notified in writing by the subcommittee chair.

UNRESOLVED DISAPPROVALS. If after the initial 45-day membership review, the open forum and the 30-day rebuttal period there are still unresolved disapprovals, a copy of the proposed DSTU, all the disapprovals, all the responses, and all the rebuttals are sent to the X12 members who originally returned a ballot, to give them an opportunity to change their original votes. If the review produces additional comments or disapprovals, these become part of the record and the final vote count, but the subgroup does not need to prepare responses. The subcommittee determines whether the proposed DSTU is ready to be reviewed by the PRB.

PRB REVIEW AND APPROVAL. The PRB reviews the disapprovals, responses, and any rebuttals to ensure that due process was followed. Approval of two-thirds of the members present is required before the document can be released or published. If more than ten percent (10%) of those members casting a ballot represent continuing disapprovals, the PRB shall not approve the document.

PUBLICATION. Those documents approved by X12 and the PRB as DSTUs are prepared by the Secretariat for publication.

Maintenance and Revision of DSTUs

When a DSTU is approved by the PRB for publication, it is automatically placed in maintenance status. The maintenance phase continues for the lifetime of the DSTU.

MAINTENANCE INITIATION. If the need is seen to change a DSTU, a work request for such activity is submitted to the Secretariat for processing. Work requests may be developed by any individual or organization whether or not associated with X12. The Secretariat forwards all work requests for maintenance to TAS.

TAS REVIEW AND APPROVAL. TAS has primary responsibility for the disposition of work requests for maintenance. A work request could be referred to one or more subcommittees. Approval of maintenance items is subject to the procedures defined for DSTUs. In the case of referred items, approval of the subcommittee(s) to whom the item has been referred is also required.

PRB REVIEW AND APPROVAL. TAS-approved data maintenance items are subject to PRB approval, as defined earlier.

X12 APPROVAL. X12 approval of maintenance items shall be conducted in accordance with the procedures defined for DSTUs, except that the TAS shall hold an open forum to discuss continuing disapprovals after the rebuttal period.

Processing American National Standards

Planning and Development Phase

The Steering Committee initiates the process of developing American National Standards (ANSs) by determining the schedule for submitting DSTUs to ANSI for public review as draft proposed American National Standards (dpANSs). Subcommittees prepare dpANSs. The PRB releases dpANSs for X12 balloting and public review. The X12 approval process may be concurrent with or may precede the ANSI public review.

X12 BALLOT. The dpANSs are approved by X12 according to the procedures for DSTUs, except that voting procedures and results are governed by this section of the OPM.

Public Review

The Secretariat initiates the public review by submitting an abstract of the dpANS to ANSI for announcement of the availability of the document for public comment. The public review period is set to be a minimum of 60 days from the announcement date. Each comment is recorded as it is received and retained by the Secretariat until the comment period is closed.

RESOLUTION OF COMMENTS. The Secretariat forwards all comments to the responsible subcommittee chair. The responsible subcommittee considers each comment and prepares a response to each. The response is sent to the Secretariat who sends it to the commentor along with a notice that there is a 30-day rebuttal period and announcing when the dpANS will be discussed in open forum. The responsible subcommittee provides an open forum at the next meeting to discuss the comments, responses to the comments, and any rebuttals to those responses. This review may result in withdrawal of the objection. It may

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also result in changes to the dpANS; approval of the revised dpANS requires vote by the responsible subcommittee.

If there are no unresolved responses and if there is no substantive change to the dpANS, the Secretariat is so notified in writing by the subcommittee chair.

SUBSTANTIVE CHANGE. If there is substantive change to the dpANS, the subcommittee instructs the Secretariat to send the revised dpANS to TAS for review. After TAS reviews the revised text, it is sent for a 30-day review to the X12 members who originally returned a ballot, to give them an opportunity to change their original votes. ANSI requires that such changes be reannounced for a second public review. This review may produce additional comments and may force a repeat of the previous steps.

UNRESOLVED COMMENTS. If there were unresolved comments, a copy of the dpANS, the comments, the responses, and the rebuttals are sent to the X12 members who originally cast a vote for a 30-day review, to give them an opportunity to change their votes. If there are both unresolved comments and substantive changes to the draft, the 30-day reviews required may be conducted concurrently.

For each unresolved comment remaining after the rebuttal period and open forum, the commentor shall be advised of the disposition of the comment and all of the reasons therefore and the Secretariat will notify the commentor that, if the commentor objects to approval of the document as an American National Standard, the commentor should so notify the Secretary of the ANSI Board of Standards Review (BSR) within 15 working days from the date of the response from X12.

PRB REVIEW. The PRB reviews the comments, responses, and rebuttals. This review is to ensure that due process was followed. This board votes that the dpANS is ready for ANSI BSR submission. A two-thirds affirmative vote of the PRB members represented at a meeting or returning their ballots for a letter ballot is required to release the dpANS. The Secretariat shall submit the dpANS to the BSR following ANSI procedures.

FINAL NOTICE. Notice of the BSR's final action on standards shall be published in "ANSI Standards Action" and announced to the X12 Committee.

Publication

The developing subgroup and the Secretariat assemble the text of the ANSs and originals or photographic quality copies of all artwork. The ANSI Style Manual shall be checked for conformance. Publication of the approved standard may be by ANSI, ASC X12, or the ASC X12 Secretariat.

Maintenance of American National Standards

A standard, upon approval by ANSI as an American National Standard, is automatically placed in maintenance status. This phase involves preparation of responses to inquiries, requests for clarification or interpretation, or other comments on experience with the standard. It also includes the activity leading to the adoption of the standard by ISO as an international standard or, if there is an international standard which differs, the resolution of the differences.

MAINTENANCE PROCESSING. The maintenance phase continues until experience or time indicates the need for a revision, reaffirmation, or withdrawal.

of the standard. If the need is seen to change the ANS, maintenance shall be conducted in accordance with the procedures defined for DSTUs.

Interpretations

An interpretation is an official clarification of a DSTU or ANS. Inquiries requesting interpretation of a standard shall be directed to the Secretariat, and the request shall be acknowledged within thirty days. This request shall be assigned to a subcommittee as designated by the X12 Chair for the preparation of the interpretation draft, and the subcommittee may request assistance from other subcommittees or a task group. The responsible subcommittee prepares a proposed interpretation and obtains X12 membership approval of the document as if it were a DSTU. If during the preparation of the interpretation a need for revision of the standard is identified, it shall be processed according to procedures. The official interpretation shall be published by the Secretariat.

Externally Developed Standards

One function of ASC X12 is to review for submission as DSTUs those standards within the X12 scope approved by organizations not accredited by ANSI for processing under ANSI procedures. The sponsor organization which prepared the proposed DSTU or an X12 subcommittee may prepare the work request. Procedures for processing a DSTU are followed.

Guidelines

As a by-product of the standards development process or for other reasons, ASC X12 from time to time may produce X12 Guidelines. Such guidelines are not standards, nor are they intended to be used as such. Guidelines are, in some cases, produced to disseminate the technical and logical concepts reflected in standards already approved or under development. In other cases, they derive from studies in areas where it is found premature to develop a standard due to emerging technology, or inappropriate to develop a rigorous standard due to the existence of a number of viable options, the choice of which depends on the user's particular requirements. Use of X12 Guidelines may result in greater consistency and coherence in information processing systems.

ORIGINATION. Guidelines may be originated several ways. A work request or project proposal for an X12 development project may suggest that the product should be a guideline. Also, after a project proposal for development of a new standard is approved, the subcommittee may conclude that a guideline instead of a standard is in order. In this case the PRB is advised for coordination and a copy of the project proposal with the reasons for the conversion is forwarded to the submitter of the original work request (if any).

APPROVAL AND PUBLICATION. The development and approval process is the same for a guideline as for a DSTU. The guideline is published by X12 or the Secretariat, who retains the copyright to the guideline in order to protect its integrity. To facilitate and encourage its use, copy authorization is granted on request by the Secretariat.

STANDARDS BACKGROUND

The following is general information on the standards developed by ASC X12 and published by DISA.

X12 American National Standards

In 1983 and again in 1986, the American National Standards Institute (ANSI) approved the publication of standards for Electronic Data Interchange (EDI) as American National Standards. These are referred to as Version 1-1983 (which were superseded by) Version 2-1986 standards and were developed by Accredited Standards Committee X12 (ASC X12).

Later, one additional transaction set standard was approved (Ship Notice/Manifest [856]), as well as the Interchange Control Structures (X12.5); these were issued also as American National Standards in 1987 and are members of the Version 2 family of X12 standards.

ASC X12 Releases

Since 1986, by approval of ANSI, the ASC X12 Secretariat (DISA) has published a series of releases. These documents (called "Release 1," "Release 2," etc.) represent X12-approved revisions of those previously published American National Standards and new ASC X12-approved draft standards not previously published. As such, releases are not American National Standards, since their contents have not been subjected to the rigors of the public review process required by ANSI for such consideration. In the form provided in releases, all of the standards are considered to be Draft Standards for Trial Use (DSTU), comment and criticism.

ASC X12's purpose in publishing these releases is to put current ASC X12-approved draft standards into the hands of users on a more frequent schedule, since the public review process, resulting in American National Standards, is lengthy. This technique is intended to speed implementation, reflect industry needs in the standards more quickly, and allow industry to gain experience with new draft standards before solidifying them as American National Standards. All Draft Standards for Trial Use undergo the ANSI-required public review process approximately every three to four years.

Version/Release Control

A release represents a snapshot in time of the status of the development and maintenance efforts of ASC X12 as of a specified date. Releases are published generally once each year in a single volume and are governed by version control numbers, reflected in the codes for Data Element 480:

Version 2, Release 0	ANSI	1986	[002000]
Version 2, Release 1	X12	1987	[002001]
Version 2, Release 2	X12	1988	[002002]
Version 2, Release 3	X12	04/89	[002003]
Version 2, Release 4	X12	12/89	[002040]

This code represents the standards' status at the time of the "snapshot" and is used to communicate implementation status to EDI trading partners, who must support the same version/release in order to effect interchange. It should not be assumed by implementers that different releases are upward or downward

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compatible; transaction sets, segments, and data elements must all be used at the same version/release level.

For Release 4 (covering X12-approved standards maintenance through May 1989) the code structure was changed to permit the designation of subreleases. Draft Standards for Trial Use approved for publication after February 1990 are published as separate documents to permit implementation by interested users prior to the annual release publication in December. Thus, the fifth character of the code designates the release, and the sixth character the subrelease:

Version 2, Release 4	Subrelease 1	X12	2/90	[002041]
Version 2, Release 4	Subrelease 2	X12	2/90	[002042]

Version Roll-Over

As required by ANSI, 28 standards issued in Release 4 (December 1989) were submitted for public review and comment. Following that approval cycle and on approval from ANSI, those documents surviving public review will be published as American National Standards, Version 3, Release 0 (estimated 1991). Releases will continue to be published annually as well.

EDI "Foundation" Standards

X12.6 Application Control Structures

X12.6 Application Control Structures is the syntax ("architecture") document which governs the other EDI standards. It contains the formal definitions of all terms related to electronic data interchange.

Releases 1-3 do not contain X12.6. DSTU X12.6-June, 1989 is the current version of the syntax document. It is available from the DISA distributor as a separate document for use with previous releases and is included in Release 4 and subsequent releases as a Draft Standard for Trial Use. Version 2 and Releases 1-4 of the standards can be processed using either the American National Standard X12.6-1986 or the DSTU X12.6-1989 versions of the Application Control Structures.

X12.5 Interchange Control Structures

X12.5 contains the specifications for the control structures (segments) for the electronic interchange of one or more transaction sets. This standard provides the interchange envelope of a header segment (ISA) and trailer segment (IEA) for the electronic interchange through a data transmission, and it provides a structure to acknowledge the receipt and processing of this envelope (TA1). This standard is self contained and governed by version control independent of the transaction set standards.

Release 1-1987 does not include the X12.5. It is available from the DISA distributor as ANS X12.5-1987 Interchange Control Structures. However, Release 2-1988 and successive releases do contain X12.5, revised and issued as a Draft Standard for Trial Use.

Interchange control segments are governed by a version control code of their own (Data Element I11); this version control is unrelated to that governing the rest of the standards. Any version of X12.5 can be implemented with any transaction set.

Segments and Data Elements

X12.22 Segment Directory and X12.3 Data Element Dictionary define the segments and data elements, respectively, that are used to construct the transaction sets.

All four of these foundation standards are required to understand, interpret and use the EDI transaction set standards, which themselves define the format and data contents of business transactions.

Standards Maintenance (Revisions)

All ASC X12 standards are subject to maintenance as soon as they are approved as Draft Standards for Trial Use. Maintenance is conducted three times a year at regular X12 working meetings, approved by the X12 Committee, and is then reflected in the annual release publication. The family of X12 standards is continually expanding as a result of development and maintenance activities supported by user industries.

Individuals, businesses and industries are welcome to present their requirements for additional EDI standards, or maintenance to existing standards, to the X12 Committee. Procedures are in place for processing these requests; use the Work Request Form (see Section VII).

Standards Development Workbooks

Three times a year, standards maintenance items approved by the appropriate ASC X12 subcommittees at a working meeting, and subsequently submitted for X12 membership approval by ballot, are applied to the X12 standards database. The results are published as a Standards Development Workbook. Workbooks are intended to assist standards developers primarily, but they are also offered for sale to the public. They are NOT intended for implementation, since they have not yet achieved Draft Standard for Trial Use status.

Publications Copyright

ANSI in New York owns the copyright for all Version 2-1986 and 1987 X12 American National Standards. Call (212) 354-3300 for information.

DISA, as the ASC X12 Secretariat and publisher, holds the copyright on X12 standards and publications issued since 1987. Requests to reproduce ASC X12 standards data in any medium, in whole or in part, should be submitted in writing to DISA, Attention: Manager of Publications, or call (703) 548-7005.

DISA Standards Distributor

Washington Publishing Company (WPC) has, by contract with DISA, exclusive worldwide distribution rights for ASC X12 standards and publications (versions, releases, workbooks, diskettes, and selected other documents). Price sheets and order forms are in Section VII.

In the United States, call 1 (800) 334-4912 to inquire about and to place orders for X12 standards. Subscription service is available. Outside the United States, you may FAX inquiries to (216) 942-9296 or write:

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Washington Publishing Company
806 West Diamond Avenue, Suite 400
Gaithersburg MD 20877 USA
(301) 590-9337

Before calling WPC, be sure you know which document you wish to order. Call DISA at (703) 548-7005 if you need more information before placing your order.

Release Diskettes

Releases can be obtained on diskette after publication. There is no programming included; the intent of the diskettes is to enable a user to load the standards tables to update a syntax analyzer or to load EDI translator software with the contents of a release. They are not intended to be used as the basis for a publication of the releases. A licensing agreement is a condition of diskette sales. Call WPC for information.

Derivative Works

If you plan to use the standards data for publishing purposes, such as implementation guidelines or PC "tools", a licensing agreement can be obtained through DISA. Contact the Manager of Publications at (703) 548-7005 for more information.

Errata Reports

Documentation errors discovered in releases are reported to purchasers and licensees at intervals. This service is included in the purchase price.

Subreleases

Subreleases are published three times each year, after each ASC X12 meeting. These cover new ASC X12 Draft Standards for Trial Use and supporting segments and data elements, as well as approved ASC X12 Guidelines. Contact WPC for information.

X12 Status Report

A detailed report on X12 Committee activities is updated at least each trimester. This document includes a description of approved standards, standards in development, project proposals, subcommittee activities, draft standards voting status, and other ASC X12 information. A "Quick Summary" list of standards published and in development is also provided (see Section IX).

Industry Conventions & Guidelines

Many industries have developed and published "subsets" of the ASC X12 draft standards as industry-recommended implementation guidelines. These industry conventions are designed to facilitate the implementation of their selected standards between members of the industry and their trading partners. Most industries that publish guidelines update them regularly to reflect the enhancements and changes that appear in each new ASC X12 release. (A list of industries with known EDI programs or publications is included in Section VI.)

Introduction to EDI

A brochure entitled "An Introduction to Electronic Data Interchange" is available. If you are interested in obtaining one copy, or bulk quantities of this educational material for presentations, contact the Secretariat.

Inquiries

Direct inquiries to the ASC X12 Committee's Secretariat:

Data Interchange Standards Association (DISA)
1800 Diagonal Road, Suite 355
Alexandria VA 22314-2852
(703) 548-7005

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